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Educational News and Editorial Comment

EXPENDITURES FOR EDUCATION

The first volume of the report of the Committee on Recent Economic Changes of the President's Conference on Unemployment, published by the McGraw-Hill Book Company, contains an interesting statement dealing with expenditures for education in the United States. This statement was prepared by Leo Wolman, of the National Bureau of Economic Research, Inc., and is as follows:

Of these social services, education not only absorbs the greatest income but appears to be growing at a much more rapid rate than the rest. The gross expenditures for this purpose are estimated to have increased from three-quarters of a billion in 1913–14 to two and three-quarters billions in 1925–26. The details are shown in Table I.

Some of this does not represent free education. American universities and professional schools spent in 1925–26 $407,400,000, of which $101,499,000 was returned to them in the form of tuition and fees. Of the $190,589,000 spent by private elementary and high schools, it can only be estimated that from one-third to one-fourth was not covered by tuition receipts. What evidence there is appears to indicate that roughly $2,500,000,000 of the total spent on public and private education in the United States in 1925–26 represents free education.

The per capita expenditures for pupils in the public elementary schools in 1926 were $63.31; in public high schools, $195.74; and in universities and colleges, $423. The total expenditures for education increased 250 per cent between 1913–14 and 1925–26.

Almost half of this increase was for free elementary schools. At the same time the enrolment in elementary schools rose from 17,934,000 in 1913–14 to 20,984,000 in 1925–26, or about 17 per cent. There has consequently been a great increase in the expenditures per child.[1] The striking increase in expendi-

TABLE I

ESTIMATED EXPENDITURES FOR EDUCATION IN THE UNITED STATES IN THOUSANDS OF DOLLARS

	1913–14	1914–15	1917–18	1921–22	1925–26
Public elementary schools, including kindergartens	486,167	530,320	599,383	1,163,374	1,328,396
Public high schools	68,911	75,141	162,876	417,297	697,912
Private elementary schools	52,042	51,683	54,989	77,398	135,680
Private high schools	14,572	14,590	34,025	32,808	54,909
Other private and public secondary schools	13,501	12,746			
Universities and colleges: Public	95,154	101,753	65,316	128,117	174,481
Private			71,740	144,698	232,919
Normal schools	15,086	15,885	20,415	20,649	28,437
Teachers' colleges	.....	.....	.....	18,145	33,374
Commercial and business schools	8,403	9,164	24,572	.....	.....
Reform schools	8,654	9,039	10,158	18,953	22,304
Schools for deaf	4,169	4,235	5,153	9,530	8,053
Schools for blind	2,477	2,618	2,932	2,894	3,838
Schools for feeble-minded and subnormal	8,753	11,209	4,568	15,094	18,364
Government schools for Indians	3,818	3,852	3,328	5,894	5,392
Total	781,707	842,235	1,059,455	2,054,851	2,744,059

tures for education, however, took place in the appropriations for high-school education. They increased tenfold, from $68,911,000 in 1913–14 to $697,912,000 in 1925–26, while the total enrolment increased more than 200 per cent, from 1,218,000 to 3,757,000. The number of college and university students likewise grew with great rapidity, from 325,219 to 822,895, during the same period. It is estimated that the expenditures for free college and university education increased in little more than a decade nearly 350 per cent.

[1] One item in the rapid increase in the total expenditures of recent years has been the increase in the amount expended for grounds and buildings and contents. Annual capital outlay per pupil in average daily attendance amounted to only $7 from 1916 to 1918. By 1925 this amount had increased to $21.86 and stood in 1926 at $20.47.

THE ALL-YEAR SCHOOL

A strong argument for the continuous operation of schools is presented in the following statement published by the *New York Sun*.

Convinced by long experience that the school vacation period and the period of greatest juvenile delinquency are closely related, the Bowling Green Neighborhood Association has begun its job of keeping hundreds of boys and girls busy from seven o'clock in the morning to ten o'clock at night. Past records have shown the Association that, with the schools closed and hundreds of children set free with nothing to do, trouble starts and police records are made.

A chart by William B. Hennessy, director of boys' work, shows that juvenile delinquency in that section of lower Manhattan served by the Association reaches a maximum at four definite periods each year. The chart, which is based on records of arrests of children under sixteen years of age, indicates that the high points of juvenile crime are Christmas time, Easter vacation, the last of June and first of July, and the last of September. It is at these times that the Association is busiest trying to keep the boys and girls of the neighborhood occupied.

All varieties of activities are used to take up the children's time, from organized play, trips, and vacations to actual employment. Many of the boys are supplied with jobs, which keep them out of mischief and at the same time give them spending money.

"From a study of juvenile delinquency for the last ten years, it is seen that seasonal shifts have a large influence," according to Mr. Hennessy. "Consider the Christmas holidays, with the excitement, the lure of shop windows, shops open until late, and children among the hurrying crowds singing songs for pennies or running errands. School closes and boys are left to their own devices and temptation—street peddling and stealing from pushcarts and small stands. This is the time of unrestraint and makes the adventurous boy a victim of the police courts.

"After the holidays the children go back to school, and there is an abrupt falling-off of delinquency until the Easter vacation. Then there is the promise of spring, with warm days; out come baseballs and bats, and the police and truant officers have a busy few weeks," he continued.

"Following this is another lull, that lasts until just before the close of school for the summer, when delinquency increases with many boys. This period lasts through the second week of July and is especially hectic. There is no school, no study, no discipline—nothing to do but look for fun. The gang starts to form unconsciously. There are exploring trips in the daytime to other neighborhoods to look for junk—anything from an automobile key up that will bring in a few pennies.

"By the third week in July, the boys are used to being their own bosses and are tired of adventures. Some go to camps. Others get jobs. Juvenile delin-

quency decreases again and remains low until school starts in September, when there is the usual increase until the children get settled and accustomed to the routine."

SCHOOLS AS CENTERS FOR THE SCIENTIFIC STUDY OF EDUCATION

In an article in the *Baltimore Bulletin of Education* entitled "Experimental Centers in the Intermediate Grades," Edna Rolker, supervisor of intermediate grades, Baltimore, Maryland, describes a type of activity which should be undertaken in every school system in the country. A part of the article is as follows:

Each supervisor in the intermediate grades invited three or four teachers under her supervision to participate in experimental work. The purpose in establishing these centers was threefold: (1) to provide opportunity for the working-out of progressive methods of education, (2) to have them serve as clearing-houses for curriculum revision, and (3) to afford definite means of testing various methods of instruction.

A great variety of units of work have been conducted in these centers—units on Baltimore; on the development of transportation on land, on water, and in the air; shelter in various parts of the world; a study of Egypt; life in the Middle Ages—these are but a sample of the wealth of work conducted under the careful planning and close co-operation of the teachers and supervisors at each successive step of the teaching. Frequently the same unit was undertaken in several centers with different types of children. Naturally, observation led to variation of methods of attack and development with given portions of the course of study with these pupils of varying abilities. In this way we have collected a great deal of valuable material which will aid teachers who wish to initiate unit work or to broaden types of work previously attempted.

These centers have proved especially valuable in aiding certain curriculum construction now in progress in Baltimore. Topics and problems suggested for investigation have been carefully thought through, planned for, and directed preliminary to their adoption in the course of study. Valuable suggestions as to methods of instruction, scope and grade placement of subject matter, and formulation of useful types of informal objective tests have been obtained through these experimental classrooms. Such contributions are proving of continuous and definite help in curriculum revision and construction.

A major purpose in establishing these centers has been to provide opportunity to approach scientifically the determining of relative values of selected methods of teaching procedure. We have established experimental and control groups for this phase of the work and have secured the necessary data for scientifically conducting the studies. Well-planned experiments have been carried on with our experimental groups, and definite checks have been used to measure im-

provement. The data which have accumulated in these projects should be exceedingly helpful in our wrestling for the solution of certain vital problems in education presenting themselves in the intermediate grades in our own schools.

INTERESTS OF LAY OFFICERS OF SCHOOLS

New York State has an organization known as the Associated School Boards and Trustees of the State of New York, with an executive office at 60 South Third Avenue, Mount Vernon, New York. In June, 1929, this organization published the first number of a quarterly bulletin. Among other items of interest in the first issue is the following statement.

Perhaps the most outstanding fact about these regional meetings is the great enthusiasm and interest shown in the discussion of school-board problems in the open forums. In several of the meetings the delegates chose to continue the discussion of school-board problems after the time set for adjournment. From the extended discussion, the topics of most widespread interest were as follows:

"How To Secure Better-trained Teachers."

"Professional Growth of Teachers."

"How To Eliminate Unsatisfactory Teachers."

"How To Take Care of the Pupils with Retarded Mental Development."

"With the Present Surplus of Teachers, Should School Boards Hire Married Women?"

"Salary Schedule."

"The Value of a School Survey."

"School-Building Standards and Costs."

"How Far Should School Boards Go in Spending Money for Remedial Health Work?"

A NORMAL SCHOOL IN 1873

The Indiana State Teachers College, Terre Haute, Indiana, has reprinted as Bulletin No. 4, Vol. XXII, five catalogues of the institution which were published in the years 1873–77. These catalogues will be of interest to students of the history of education.

The catalogue for 1873, which is much more elaborate than the others, describes the conditions of admission in the following paragraph.

Pupils, if females, must be sixteen years of age; if males, eighteen. They must possess good moral character and average intellectual abilities. If residents of Indiana, they must promise to teach, if practicable, in the common schools of the state a period equal to twice that spent as pupils in the Normal

School. They must pass a fair examination in reading, spelling, geography, and in arithmetic through percentage. They must write a legible hand and be able to analyze and parse simple sentences.

The outline of the course for the first term is as follows:

FIRST TERM (15 WEEKS)

English language

1. Use of dictionary, embracing (*a*) Webster's notation, (*b*) drill on the elementary sounds of the language, (*c*) orthography, (*d*) meaning and use of prefixes and suffixes, (*e*) etymological analysis of words.
2. Exercises in thinking and in expressing what is thought.

Geography

(*a*) Geometrical forms, (*b*) astronomy, (*c*) mathematical geography, (*d*) use of the globe and map, (*e*) problems in latitude and longitude.

Arithmetic

(*a*) Fundamental ideas and principles of the subject and the order of their dependence, (*b*) practice in the art. Special attention to forms for the solution of problems and to accuracy and rapidity.

Mind

Elements of mental science.

Penmanship

Behavior

Under the caption "Facts Shown by Statistics" the following information is supplied.

First, the majority of persons who enter a normal school are between twenty and thirty years of age and have, therefore, considerable maturity of mind and are somewhat fixed in their habits—have some stability of character. This, with another fact, that the pupil must have good health as one of the legal qualifications for admission, indicates that the students are capable of close and continued application under proper regulations. They are at an age when they are supposed to have some well-defined purpose in view.

Second, the majority of our students are wholly dependent on their own previous industry and economy for the means of supporting themselves while attending the school. If the expense of tuition were added to the expenses which they now sustain, the number of their class—the self-sustaining—would be smaller. If the legislature would make a special appropriation for paying the necessary expenses of this class of students in traveling to and from the Normal School, or for providing boarding-halls at which board could be furnished at a low price, or for purchasing the needed textbooks—if any one or all of these expenses could be defrayed in part by a special appropriation of the legislature—it would not be a misappropriation. It would largely increase the attendance of the class named. Those who, under adverse circumstances, show energy of character enough to save means by which to pay their expenses at the Normal

School for one or two terms and who, by their attendance, show an aspiration to better fit themselves for teaching and who are quite willing to pledge themselves to teach in the common schools twice as long as they are members of the Normal School would certainly not be unworthy recipients of the state's encouragement and assistance.

Third, nearly 73 per cent of our students have received only such education as our common schools give; and 68 per cent of the whole number have held licenses to teach. These two facts forcibly suggest that the common schools themselves are furnishing the state with a large majority of its 12,000 teachers. Statistics in addition to those cited might be given to show conclusively that the majority of the teachers of the state have received only a common-school education. In relation to this fact, the Normal School may be seen to be both a practical and a logical necessity.

Fourth, classed on the basis of occupation, it is observed that 57 per cent of the parents of the students are farmers; 18 per cent are mechanics. Seventy-five per cent of the whole number of students come from two classes—farmers and mechanics.

WINDOW VENTILATION

The following summary of a report made by the United States Public Health Service was published in the *New York Times*.

A report relating to respiratory illnesses and types of ventilation in schools has recently been made public by Surgeon-General H. S. Cumming, of the United States Public Health Service. In this study a comparison is drawn between two groups of schools, one group ventilated by mechanical means and the other by the natural open-window method. The groups are very nearly equal in size, the mechanically ventilated group having 1,573 pupils and the window-ventilated group, 1,546 pupils.

The two groups are highly comparable in composition, the first having 17.5 per cent of pupils of American parentage and the second, 15.0 per cent of such pupils. The average age of the pupils in the first group is 7.9 years; in the second, 8.6 years. The sex distribution of the pupils is practically the same in both groups of schools. "The weighted mean temperature of the rooms of the schools throughout the course of the study," says the Service, "was found to be very nearly the same for both groups, being 67.8 degrees Fahrenheit for the mechanically ventilated group and 68.1 degrees for the naturally ventilated group. The total respiratory-illness absenteeism findings of the study show the rate for such absences in the mechanically ventilated group to be 3.0 per cent of the pupil sessions and for the naturally ventilated group, 1.8 per cent.

"If, instead of total respiratory illness, we use independently collected data concerning only those illnesses causing an absence of three days or more, the study disclosed a respiratory-illness rate of 3.3 per cent of the pupil sessions in the mechanically ventilated group of schools as compared with 1.2 per cent for the naturally ventilated group.

"It is important to note that the respiratory-illness absence of a duration of three days or more in the mechanically ventilated group of schools was in excess of that found in the naturally ventilated group in all cases and that the same was true for respiratory-illness absenteeism for a duration of one-half day and more, with but one exception. In this case the mechanically ventilated school had a rate of 4.4 per cent, while the window-ventilated school had a rate of 4.7 per cent. And, lastly, it might well be pointed out that the actual numbers of absences of a duration of three days or more amounted to 359 in the mechanically ventilated group as compared with 133 in the window-ventilated group. From these data it appears reasonable to conclude that the atmospheric conditions produced by the systems of mechanical ventilation in use at the time of the study were associated with higher respiratory-illness absence rates. These studies, however, should certainly not be interpreted as condemning all mechanical systems of air-conditioning.

"It is not possible to state with which element or elements of the atmospheric conditions lies the responsibility for these observed differences in absenteeism. Our investigations concerning temperature conditions indicate the weighted mean temperatures of the two groups of schools to be very nearly alike. More detailed investigations of temperature may be of value. Certainly in the problem of school ventilation the elements of humidity and air motion require further detailed study, which, unfortunately, this investigation could not supply.

"The present study confirms the findings of the New York State Commission on Ventilation of 1916–17 except in so far as these studies bear on the importance of very slight degrees of overheating. Likewise, the present studies confirm those of the New York Ventilation Commission made in Syracuse, New York, in 1927. It may be well to recall a statement from the report of the New York State Commission on Ventilation:

" 'Because window ventilation is practicable for the ordinary schoolroom, it does not follow, of course, that the assembly room, the theater, and other places seating, in certain cases, many people can also be dealt with in this manner. Each type of inclosure must be handled as a distinct problem. Natural ventilation has its limitations. That the schoolroom is not beyond these limitations is indicated by this study.' "

EDUCATIONAL RETARDATION OF CHILDREN IN MIGRATORY FAMILIES

The California survey showed that a very large percentage of the retardation of pupils in the schools in that state results from the migration of families from one locality to another. Recent studies made in Maryland give further emphasis to the disrupting influence of family migration on the education of children. The *United States Daily* published the following summary of the Maryland study.

The Maryland commissioner of labor and statistics has recently published two studies dealing with children of migrant families employed as pickers of fruits and vegetables on the farms of Anne Arundel County and as helpers in the canneries of four other counties during parts of the summer of 1928.

The children employed in the field work were mostly Poles, whose families had come from Baltimore for the seasonal work of picking, which would last for eight or ten weeks. The family groups in this case included very few men or children over sixteen; all such who had a job were holding on to it, and only those who were unemployed or who could not get work in the city migrated to the country.

Some 262 families were found, including 1,255 individuals, of whom approximately 800 were children aged from three weeks to sixteen years. About 560 children were employed in the picking. Hours were irregular, and earnings—all piecework—variable, being affected by the weather, the condition of the crop, and other factors.

Within the last few years, it is said, the farmers have become reluctant to employ young children, thinking they are too destructive to the crop; some refuse to take on children under eight, and others place the age limit several years higher. The work is entirely unskilled, so that young children can be employed if the bosses and the parents wish.

The canneries, at the time the study was made, were working on tomatoes and presented the conditions of heat, sloppiness, and discomfort made familiar by earlier investigations. Of the total group of 289 visited, 180 employed children under sixteen, and, in these, 976 children—577 white and 399 colored—were working.

In the plants of which a special study was made, the migratory workers, with the exception of one group of Poles from Baltimore, were all colored people secured from Baltimore and various parts of Maryland, Virginia, and Delaware.

In the field work and the canneries alike the most serious features, so far as the children are concerned, are the interruption of school attendance and the insanitary living conditions to which many of them are subjected. As to the first point, many of the migratory families go to the fields by the middle or later part of May, taking the children from school some weeks before the term is finished. Not infrequently the same families stay on for work in the canneries, which means keeping the children from school for some weeks after it opens in the fall. This interference affects not only the children old enough to work but all of the family group.

A study of 220 children, aged eleven to fifteen, inclusive, found working in thirty-four canneries, showed that many of them were retarded, some very considerably. Presumably the same situation would be found to exist among the younger children of these families, who were not working but none the less were kept from school by the family migrations.

RETARDATION AND PROMOTION IN THE SCHOOLS OF NEW YORK CITY

A quarter of a century ago William Maxwell, superintendent of the New York City schools, discovered the fact which has since been known in educational literature as "retardation." In his vigorous reports Superintendent Maxwell suggested measures which may be taken to improve the situation. It is interesting to find that the present superintendent of the New York City schools is discussing in his annual report non-promotion, the cause of retardation.

The report contains a table showing the percentage of promotions for a period of years. This table and accompanying comments are as follows:

Year	Percentage of Promotions	Year	Percentage of Promotions
1918.....	88.4	1924.....	90.3
1919.....	89.0	1925.....	90.9
1920.....	88.7	1926.....	91.3
1921.....	88.6	1927.....	91.8
1922.....	88.0	1928.....	92.5
1923.....	89.1		

Except in those cases where pupils did not receive end-term promotions but did receive mid-term promotions, non-promotion means slow progress. Slow progress or retardation is the chief cause of over-ageness, and any increase in the number of over-age pupils means a probable increase in the number of pupils who will be eliminated from the elementary school without completing the course.

Non-promotion is undesirable for other reasons. Rarely, if ever, does a pupil who is held back need to repeat all the work of a grade. Hence, there will always be some waste of time and energy in the instruction of hold-overs. It has also been shown that for many pupils non-promotion is not a stimulus to harder work. Rather does non-promotion result in depression, loss of interest in school, and a lower coefficient of efficiency.

On the other hand, we cannot expect all children to cover a course of study at the same rate. But the wide variability in the rate of promotion in different schools, sometimes in the same neighborhood, shows that there exist, at the present time, different standards of promotion and different conceptions of the purposes of promotion. A special study of promotions in certain grades revealed the fact that in some schools there were more cases of non-promotion in the bright classes than there were in the slow classes.

All this seems to point to the need of a special study of the standards and

aims of promotion with a view to a possibly greater uniformity of purposes and the wider application of principles and devices that have been used successfully in certain schools.

THE SEATTLE INTERMEDIATE CLUB

A yearbook issued by the Seattle Intermediate Club describes the development of the intermediate schools in Seattle since their establishment in 1926. One item of general interest is the statement made by Arabel Campbell, president of the Club, of the considerations which led to the organization of a separate association of the teachers in the intermediate schools.

Prior to the adoption of the intermediate schools, there were in Seattle two teacher organizations, namely, the Grade Teachers' Club and the High School Teachers' League, which took care of the problems of the teaching corps. Upon the opening of this new type of school, the teachers soon became aware that they had problems which were entirely different from those of the other two groups.

The seventh, eighth, and ninth grades could be placed in a building by themselves, but that would not make it an intermediate school. The class procedure is not like that of a secondary or elementary school. It is called the "intermediate" school in order to refrain from using high-school methods.

The curriculum should be adapted to the needs of the child. It should be enriched by special subjects which will give to the child a broader vision of his future opportunities. Having a large number of pupils enrolled in a class makes it possible for them to be grouped according to their various abilities and the subject matter adapted to them. The teachers should have a thorough understanding of this curriculum and how to adapt it to the pupils of the adolescent age. At the club meetings, material may be presented from this viewpoint. Thus, the Seattle Intermediate Club was organized to stimulate and promote greater interest in professional growth and advancement.

INSTRUCTION IN INSTRUMENTAL MUSIC PROVIDED BY A CITY SCHOOL SYSTEM

The following statement is quoted from the *Christian Science Monitor*.

Any child attending public schools in Milwaukee can take music lessons on any band or orchestra instrument for ten cents. He does not even have to possess an instrument of his own to take advantage of these practically free music lessons which the city school system provides.

As a result of this unique service, more than 2,400 pupils in graded and high schools now gather on Saturday mornings at one or another building given over to various kinds of lessons. Of these pupils, 600 alone attend wind-instrument classes, and another 600 are learning to play stringed instruments. Piano classes

are the most popular, drawing almost 1,200 pupils and requiring four supervisors. The pupils are taught, not singly, but in classes!

This is an almost new method, but so successful has it proved that other cities are already writing the Milwaukee school board for particulars and beginning to follow its example in group teaching. Accounting for the surprisingly successful results of the Milwaukee plan, Herman Smith, director of public-school music, under whose jurisdiction the experiment is being worked out, says:

"There are many things that a teacher must tell a pupil who is just starting to take music lessons. Such preliminary instruction may obviously be given to twenty pupils at once just as well.

"What hasn't yet been generally recognized by music teachers, however, is that there is really nothing about the first two years of music instruction which necessitates private instruction."

But this was what Mr. Smith and his willing colleagues in the experiment believed six years ago—that it would be possible to apply to the teaching of music those sound fundamentals underlying classroom methods and that they would apply in music as they do in geography, arithmetic, and history. The aid of friendly rivalry, competition, and the encouragement that emanates from a group all bent on the same objective could then be taken advantage of.

The results of the past six years have demonstrated the soundness of Mr. Smith's views.

The development of professional musicians is not the object of the Milwaukee plan, although many have emerged as a result of it. Its real hope, however, is to discover talent.

"Any child who has the urge to learn to play can have a try at whatever instruments he yearns to learn," Mr. Smith continued. "If, at the end of two years, it is demonstrated that he has talent, he can then transfer to a private teacher if he is financially able, and, if he is not, he will have actual data to present to some benevolent person who may be persuaded to help him. If, on the other hand, these two years of instruction, at nominal cost, tend to show that in all probability he will never become a player of pronounced ability, it has cost him little to find it out. His parents won't begrudge him his trial at such a small cost."

It took only $2,000 to launch the Milwaukee plan. This sum, not specifically appropriated for the experiment, was taken out of a fund provided for musical equipment. The school budget now includes $15,000 a year for the ten-cent music lessons. From this sum the necessary teachers are paid, and each grade and high school is gradually acquiring a valuable equipment of instruments.

PROPOSED FEDERAL SUBVENTION FOR RURAL ELEMENTARY SCHOOLS

During the last session of Congress, Representative Charles Brand, of the Seventh District of Ohio, introduced a bill providing

that $100,000,000 be made available on the 50-50 plan for the support of rural elementary schools in the various states. The arguments in favor of this measure are presented by Representative Brand in the following statement.

The national government has granted federal aid to higher education for many years.

It is known that money is escaping from rural sections into more populous centers to a greater and greater degree. Chain stores are sending their profits out daily. Buying fencing and farm machinery at present prices with wheat, corn, and oats leaves the real profit deposited in the manufacturing centers.

This wealth is leaving the rural sections and in fact does not halt in very many of the states but coagulates in a few large centers, where it pays income tax to the national government, and the only way to get any of it back is to send it back from the United States Treasury.

The biggest product of the farm goes to the city for nothing. I refer to the boys and girls who graduate at a cost of $2,000 apiece for education and $2,000 apiece for keep, and the country loses them to the city permanently, and the money they have cost never returns to the rural section. The United States Department of Agriculture advises me that two hundred such children leave each county in Iowa annually for the city, a drain of $800,000 each year from each county.

Education in the country is more expensive than education in the city. Consolidated schools make necessary more trucks than teachers.

Farmers are paying fifty cents out of every net dollar of profit on the farm for taxes, and 53 per cent of those taxes are for schools, and the price of land has broken down so that state tax commissioners are being forced to reduce valuations of land for taxation, and this reduces school money.

If the farmer is to have equality of opportunity, he must first have equality of education, and we have come to a place where this equality of education cannot be maintained by the local rural units.

SHALL THE REGISTRATION IN TEACHER-TRAINING INSTITUTIONS BE RESTRICTED?

Scotland, like the United States, has more graduates of teacher-training institutions than can be absorbed in the positions which are open in the schools. It has been suggested there, as here, that the situation be met by restricting admission to the institutions which prepare for the teaching profession. The following statement published in the London *Times Educational Supplement* shows that the device of restricting admission to teacher-training institutions has been carefully considered and finally discarded in Scotland.

The national committee for the training of teachers is confronted with a perplexing problem—the restriction of entrants to the training centers for next session. At a special meeting it appeared that a considerable number of students who completed their training in 1928 are still without posts, while, of those just completing their course, only a small proportion have promise of immediate employment. Nor can it be anticipated that those seeking situations will nearly all be absorbed during the coming session. The present applicants for admission, of whom the majority are graduates, exceed in number those of last year, and, if all are accepted, it is evident that a year hence the unemployment position will have become still more acute. The committee's special difficulty is to devise a plan whereby the numbers might be cut down without injustice being done to one or other class of applicants. The outcome of the committee's deliberation has been to resolve to place no obstacle in the way of any qualified candidate and simply to give warning of the risks that students are running in entering a profession already overcrowded. Intending entrants should think twice before embarking on a career that involves meantime a course of training occupying a valuable year of life and leaves them at the end without prospect of finding employment for two or three years after that.

RESEARCH PROJECTS OF THE BUREAU OF REFERENCE AND RESEARCH OF THE NEW YORK CITY SCHOOL SYSTEM

Eugene A. Nifenecker, director of the Bureau of Reference and Research of the New York City school system, has included in his annual report to the superintendent of schools a list of the projects which have engaged the attention of the Bureau during the past school year. Mr. Nifenecker points out that the list shows some lack of continuity of effort because the bureau is a service agency and is frequently called on by the administration to perform practical tasks, which prevent the adoption of any well-co-ordinated program of research. In spite of its limitations, the list of projects is suggestive as indicating the range of activity of a highly organized efficiency bureau. It includes the following:

Pupil Classification in the Bronx Continuation School
Studies and Analyses of Age-Grade Status and Pupil Progress for 1927–28
Pupil Promotions, Day Elementary Schools, 1927–28
Subject Promotions in High Schools
Graduates' Progress
One Hundred Per Cent Promotion Plan (The director served as a member of a committee appointed by the superintendent of schools to study the validity of a plan of promotion in operation in P. S. 114, Manhattan.)

Subject Promotion in Training Schools

City-wide Tests in Reading—June, 1927

Tests in Reading, Arithmetic, and Language Usage in Training Schools

Diagnostic and Remedial Work in Problem Reasoning

Diagnostic and Remedial Work in Arithmetic in IV A Classes

City-wide Tests in Arithmetic

Training-School Tests

The Effect of the Use of Flash Cards on Silent-Reading Ability—P. S. 188, Manhattan

Relative Merits of the Austrian or Additive and Take-away and Equal-Additions Methods of Subtraction

Study Habits of Children in Geography

Minimal Spelling List (The preparation of a minimal spelling list begun the previous school year was continued during the period under report.)

A Study of the Vocabulary of Arithmetic

License Number 1 Examination

Reliability of Examination for License Number 1

Principals' Examination—Preliminary Test (At the request of the Board of Examiners, an analysis was made of the difficulty of the test items in the general-information test of the examination for license as principal.)

Budget Estimates for 1928 and 1929

Apportionment of Funds for 1928

Estimates and Analyses of State Aid Received under the Dick-Rice Law

Report upon the Relief Afforded by the Opening of New School Buildings

Statistical Section of Report of Superintendent of Schools

Survey of the Work of the Clerical Staff of the Teachers' Council

Survey of the Lecture Bureau

Statistical Data—For Legislative Committee on Taxation and Retrenchment

Medical Examination of Pupils (A study to show in Grades III B–VI B the relative inadequacy of present organization of medical examination of pupils)

A DIAGNOSTIC CHART FOR DETERMINING THE SUPERVISORY NEEDS OF TEACHERS OF ARITHMETIC

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In order that the supervision of instruction in arithmetic may be most effective, it is necessary that principals and supervisors proceed on the basis of a careful investigation of teaching practices by means of a definite plan of analysis and diagnosis of teachers' problems. An essential element of such a supervisory program is the use of a diagnostic technique by means of which the supervisory needs of the teachers can be definitely determined. The need for such a diagnostic technique arises out of the fact that general standards for evaluating teaching are not adapted to the detailed analysis of instruction in a particular subject, such as arithmetic. General standards are obviously helpful, but they afford an inadequate basis for locating specific teaching problems in the field of arithmetic.

The first step in developing a diagnostic chart to be used in the location of teachers' supervisory needs is the setting-up of a list of definite objectives of instruction in the subject under consideration. The next step is to make an analysis of the general and specific methods of teaching by which these objectives are to be achieved. Obviously, the bases for determining the validity of the approved methods must be the philosophy of method which is accepted by the schools and the extent to which the details of the methods are based on the results of the scientific study of teaching. The third step in the preparation of such a diagnostic chart is the observation of teaching in the classroom to locate the main teaching difficulties and deficiencies in instructional procedures. The list of items included in the chart should constitute a fairly complete analysis of the major objectives of the subject, the specific teaching procedures that are approved, and the main teaching difficulties.

So far as possible, the items in the chart should be stated in such

a form that a supervisor's analysis may be based on definite, observable traits or activities. Each item in the list should be of such a character that it is possible for several trained persons observing the same lesson to arrive at approximately the same conclusions with respect to the item. To facilitate the use of the chart, the items should be grouped according to function and procedure so that their relation to specific teaching problems is clear.

The observation of the work of many teachers of arithmetic shows that their supervisory needs vary considerably in scope and in degree. Some teachers have many difficulties, some of which are marked and difficult to overcome; others are minor in character and easily eliminated. Some teachers have such skill in the performance of important teaching procedures that their methods can be used as a basis for improving the instruction of all teachers. For this reason, as Stone[1] suggests, a form of analysis which estimates the teacher's skill with reference to a list of items on a broader basis is equally important. At present we must rely on the subjective estimates of supervisors to determine the degree of a teacher's difficulty or skill with respect to a given item. By careful research it may be possible to develop definitions of degrees of difficulty or skill which may stabilize judgments and tend to increase their reliability. The effectiveness of the supervisory work can be measured by the increase in the skill of the teacher with respect to various items and by the extent to which teaching difficulties are eliminated or reduced.

The diagnostic chart here presented is not designed to be used in the rating of the teacher; its function is to assist the supervisor to determine instructional needs in order that the supervisory program may be intelligently directed. The procedures to be used by the supervisor to help the teacher to improve will, of course, be determined by the character of the supervisory needs of the teaching group. Certain needs may be common to the whole group and should be dealt with accordingly; other needs may be found in the work of only a few individuals. In such cases conferences, references to scientific studies, observation of the work of teachers who have

[1] Clarence R. Stone, "Diagnostic Technique in the Supervision of Reading Instruction," *Scientific Method in Supervision*, pp. 174–80. Second Yearbook of the National Conference of Supervisors and Directors of Instruction. Edited by James Fleming Hosic. New York: Teachers College, Columbia University, 1929.

marked skill with respect to the items causing difficulty, and similar supervisory procedures may afford the best basis for remedying the conditions.

The chart is comprehensive in character. The detailed analysis that is given under each of the main points in the outline contains items similar to those which good supervisors and principals use in analyzing instruction in arithmetic without reducing the basis of analysis to writing. The chief value of such a detailed chart formulated according to the procedure previously outlined is the increased likelihood that the supervisor will consider all the important points in making an analysis of supervisory needs. "His diagnosis on the basis of a well-formulated analysis is more thorough and more objective than a diagnosis without such an analysis."[1] The accuracy of the diagnosis depends on the extent to which the judgment of the observer is reliable and valid. The intelligent use of a detailed chart, such as that here presented, based on a comprehensive study of all important phases of instruction in arithmetic, will tend to free the individual supervisor from the "narrowing influence of personal bias" and prejudices. It is, of course, perfectly possible for any supervisor to develop a similar chart quite different in content and in point of view.

The supervisor can also use such a diagnostic chart as a self-survey device for teachers by having them indicate what in their opinion are their supervisory needs. Hanson[2] has shown that teachers are able to indicate their teaching difficulties by means of check lists with a high degree of reliability as measured by the extent to which they report the difficulties that are detected by trained observers. A supervisor can submit the chart or any part of it, therefore, to his teachers and thus determine the supervisory needs of the entire teaching body. The results of such a survey will enable the supervisor to plan a supervisory program which can be most helpful and fruitful.

[1] Clarence R. Stone, *op. cit.*, p. 179.

[2] Ernest M. Hanson, "Classroom Difficulties of Student Teachers," *Scientific Method in Supervision*, pp. 106–29. Second Yearbook of the National Conference of Supervisors and Directors of Instruction. Edited by James Fleming Hosic. New York: Teachers College, Columbia University, 1929.

At the top of the chart is a code by means of which the observer can record his evaluations of the teaching. Space is provided at the right for recording judgments.[1] The record can easily be made cumulative in form by increasing the number of spaces for recording data. Records of supervisory needs can thus be made repeatedly and improvements noted. Such records can be kept in the personnel files.

DETAILED CHART FOR MAKING AN ANALYSIS OF THE SUPERVISORY NEEDS OF A TEACHER OF ARITHMETIC

Name _____ Room _____ Grade _____

Recording code: + = Superior quality; relay to other teachers
△ = Average level
− = Needs help
o = No evidence

1. Background of technical teaching equipment
   - *a*) Knowing the processes and topics to be taught the class
   - *b*) Knowing the historical development and significance of the important applications of number
   - *c*) Knowing current social applications of number in business, etc.
   - *d*) Having reasonable speed and accuracy in computation
   - *e*) Knowing short-cut methods of computation
   - *f*) Knowing reasonable standards of attainment
2. Knowledge of specific objectives and functions of arithmetic
   - *a*) Using materials and processes having social value
   - *b*) Showing how number has aided in the systematizing of the quantitative aspects of the environment
   - *c*) Developing an appreciation of the informational function of arithmetic
   - *d*) Developing an appreciation of number as a means of precise and accurate thought
   - *e*) Having an appreciation of arithmetic as a social study of great importance
   - *f*) Assisting pupils to understand quantitative references in readings
   - *g*) Developing adequate concepts of units of measurement
   - *h*) Training pupils in the use of reference materials
   - *i*) Selecting social applications of value
3. Recognition of the function of general method in the teaching of arithmetic
   - *a*) Knowing how to organize subject matter into large units for study by the class

[1] This space is not shown in the chart as here presented.

b) Securing a learning situation in which motives of a relatively high order are present
c) Providing conditions in which the growth of desirable social characteristics, attitudes, and ideals will take place
d) Recognizing the possibilities of socializing experiences in the lesson
e) Enriching and vitalizing the experiences of pupils
f) Recognizing arithmetic applications in other subjects, such as history, geography, science, and health work
g) Using experiences and activities that arise in connection with local conditions and situations
h) Providing correlations between subjects in situations in which number functions

4. Procedures in presenting new processes
   a) Knowing the steps in the learning process
   b) Showing the social utility of the new step in a process through applications and problems
   c) Using previously acquired skills in presenting a new step
   d) Presenting only one new step at a time
   e) Considering special difficulties in the new step
   f) Providing adequate practice on the new step
   g) Giving special help to those pupils for whom the class presentation is not adequate
   h) Teaching efficient methods of work
   i) Providing for repeated review of the new step in subsequent lessons to insure retention of the new skill
5. Procedures in diagnosing pupil difficulties
   a) Locating the specific needs of the pupils in the class
   b) Knowing the most common pupil faults and weaknesses in processes
   c) Using suitable diagnostic procedures
   d) Preparing informal diagnostic exercises
   e) Teaching pupils to diagnose their own difficulties
   f) Adjusting the class work in such a way as to have time available for the diagnosis of pupil difficulties
   g) Selecting pupils in need of intensive diagnostic study
   h) Keeping records of diagnosis
   i) Filing the results of standard diagnostic tests
   j) Using graphs, etc., to interpret shortcomings
   k) Using school records to locate other causes of deficiencies
   l) Considering the pupil's personality as a factor in diagnosis
   m) Interpreting the results of the diagnostic study
6. Procedures in providing remedial instruction
   a) Selecting remedial exercises adapted to the needs of each individual
   b) Organizing group work as the basis for instruction
   c) Eliminating faulty habits, such as counting

d) Correcting faulty, inefficient methods of work
e) Teaching methods of checking all work
f) Using pupils whose work is satisfactory to assist deficient pupils
g) Devising methods of showing pupils their improvement
h) Teaching pupils how to select the proper remedial exercises
i) Providing for variations in rates of pupil progress
j) Evaluating the effectiveness of remedial work by means of tests
k) Setting up reasonable standards of attainment
l) Teaching pupils good techniques of problem-solving

7. Methods of making the work vital and meaningful for the pupils
a) Teaching pupils to purpose to improve
b) Using materials of the proper level of difficulty
c) Motivating the drill work
d) Making pupils conscious of objectives
e) Helping pupils to diagnose their difficulties
f) Helping pupils to overcome their difficulties
g) Using graphs, charts, etc., to show achievements
h) Using games
i) Providing activities in which arithmetic processes are applied concretely
j) Showing the life-need of processes prior to teaching them
k) Using illustrations from daily life to show applications of processes
l) Encouraging original applications of processes
m) Showing applications of processes in other subjects
n) Using excursions, exhibits, and projects
o) Showing social significance of quantitative concepts
p) Providing opportunities for exploring topics of special interest
q) Requiring pupils to keep notebooks on topics being studied
r) Assigning topics for special reports
s) Distributing opportunity for participation in class activities
t) Organizing the subject matter to be taken up into coherent units, stressing applications and functions

8. Methods of socializing the work in the class period
a) Providing for group or committee work on special topics
b) Providing opportunities for pupils to assist in planning and organizing class activities and discussions
c) Using superior pupils to assist pupils below standard
d) Assigning special topics for research
e) Encouraging practical applications of processes in the home and elsewhere
f) Organizing the aspects of the school bank, milk supply, etc., in which arithmetic is used in such a way that pupils participate in phases of the activity

g) Considering questions of thrift in the home, in school, etc.
h) Using a socialized form of recitation
i) Considering the social significance of such topics as money and the number system
j) Arousing interest in topics being considered by the class and developing habits of extensive reading on such topics
k) Developing an appreciation of the social significance of quantitative relations
l) Posting papers of special merit
m) Encouraging courtesy on the part of pupils whose work is completed before that of the others
n) Requiring neatness in all written work

9. Use of tests in instructing
   a) Standard tests
      (1) Giving tests
      (2) Scoring tests
      (3) Tabulating test results
      (4) Interpreting test results
      (5) Considering limitations of tests
      (6) Charting test results
      (7) Using test results as the basis for grouping, for remedial work, etc.
      (8) Using the results of diagnostic tests
      (9) Utilizing provisions for securing test materials
      (10) Filing findings and test papers
      (11) Selecting suitable tests
   b) Informal tests
      (1) Constructing tests
      (2) Giving tests
      (3) Scoring tests
      (4) Using tests effectively, as inventory, pretest, retest, etc.
      (5) Tabulating test scores
      (6) Interpreting test results
      (7) Considering the limitations of test scores
      (8) Varying the form of test used
      (9) Using test scores as the basis for remedial work, diagnosis, etc.
      (10) Filing tests for future use
      (11) Using school equipment, such as mimeograph, in preparing tests
      (12) Preventing pupil cheating on tests
      (13) Co-operating with other teachers in the preparation of tests
   c) Pertinent data from other tests
      (1) Considering intelligence-test scores in diagnosis
      (2) Using reading-test scores as basis for diagnosis of difficulties in problem-solving

10. Points of a general character
   a) Filing materials of instruction, such as drill cards
   b) Keeping records of pupil progress
   c) Planning work, preparing materials to be used, etc.
   d) Preparing improved types of supplementary materials
   e) Distributing time to problems and formal drill work
   f) Handling the disciplinary problem
   g) Keeping available materials essential in an ideal modern program of arithmetic
   h) Using the course of study for reference and guidance
   i) Using the textbook as a teaching tool
   j) Reading important scientific contributions on aspects of arithmetic
   k) Handling details of method technique
   l) Supervising pupils' work during supervised-study periods

DIFFERENTIATION OF COURSES OF STUDY IN DENVER FOR SLOW-LEARNING CHILDREN

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Introduction to the problem.—One of the crucial problems in the educational field today is that of modifying school work to meet the needs of children of limited intelligence. Arthur I. Gates, of Teachers College, Columbia University, says: "To enable each child to develop in the happiest and socially most productive manner requires an educational program differentiated both in degree and in kind."[1]

Statement of Denver's problem.—For many years the Denver schools have made provision for children of limited ability in both regular and special classes. The Curriculum Department began an intensive study of the problem of differentiating curriculums for these children in October, 1927, after the new courses of study in all elementary-school subjects had been revised for normal children. In the present discussion the term "slow-learning children" is used to designate children of limited intelligence. The intelligence quotients of such children as determined by the Binet test range from about 70 to 90. However, this test is not a complete measure of general intelligence and is not so considered in determining slow-learning children in Denver. A small percentage of these children are cared for in special rooms, but the great majority of them are found in the regular classrooms in Denver, as in most cities throughout the state and country. Wherever they are, they need special individual attention both for their own progress and for the well-being of their associates.

Point of view of committee.—The last decade has seen a welcome change in the attitude of the educational world toward children of limited mental ability. It has become more helpful and construc-

[1] A. I. Gates, "Recent Advances in Educational Psychology," *School and Society*, XXIX (January 5, 1929), 5.

tive. Progressive educational procedure now takes into full account the many vocational possibilities open to these children and plans its educational courses accordingly. The Denver committee working on the problem has attempted to present its findings in terms of a positive constructive philosophy, stressing what the slow-learning child can do instead of what he cannot do, stressing his capacities in terms of mental age instead of his incapacities in terms of intelligence quotient.

Aim of education.—The plan of differentiating curriculums for slow-learning children is based on the belief that the object of education is to provide exercise for the child's capacities no matter how limited they may be. It is the duty of the school to provide the dull child with a school environment that offers opportunity and incentive to exercise the best of his mental abilities. To do this, two things must be known: (1) the nature of the child's abilities and disabilities and (2) the type of environment that will best stimulate him to successful endeavor.

Objectives for slow-learning children.—Modern educators agree that the general aims for the subnormal child are the same as those for the normal child. The prevailing philosophy emphasizes social usefulness as the objective of all education. This goal is achieved for all types of children through the seven cardinal objectives of education, namely, health, worthy home membership, command of fundamental processes, vocational efficiency, citizenship, worthy use of leisure time, and ethical character. By their very nature, these cardinal objectives do not permit of differentiation. For the child of limited mental ability, however, the ways and means of achieving these objectives will be different; the level of achievement will be lower; the emphasis on certain objectives will be stronger. To illustrate, the final goal for all children is to become self-supporting, self-controlled citizens. The normal child attains this goal far more easily than does the subnormal child because he is by nature equipped with a normal intelligence which helps him to adjust himself readily to his environment. Stern defines intelligence as the "general mental adaptability to new problems and conditions of life."[1]

[1] William Stern, *The Psychological Methods of Testing Intelligence*, p. 3. Translated by Guy Montrose Whipple. Baltimore: Warwick & York, Inc., 1914.

Adjustment of objectives for slow-learning children.—The subnormal child is limited in intelligence—limited in all that aids him in adapting himself readily to his sociological environment. Hence the school must stress those objectives which will best serve to develop and strengthen his character, habits, and vocational efficiency. On the development of ethical character depends the successful future of the self-controlled citizen. On the development of vocational efficiency depends the successful future of the self-supporting citizen. These goals need special emphasis for subnormal children. The means by which they are reached must be more simple, more concrete, and more specific than are those in the case of the normal child.

Regular courses of study used as basis for differentiation.—A study of the objectives of the new Denver courses of study for the elementary grades led to the conclusion that these courses furnish a safe foundation for curricular adjustment for the slow-learning child because they are designed to meet the general aims for all types of children. Hence, Denver's differentiated curriculums for slow-learning children are based on the regular courses of study. However, to meet the limited abilities of these children, the regular courses of study have been adjusted in three general respects: (1) in subject matter, (2) in methods of procedure, and (3) in standards of attainment.

Psychological basis for adjustment.—Before any adjustment could be made, it was necessary to establish a psychological basis for each change in subject matter, methods, and standards. An intensive study of the psychology of subnormal children yielded pertinent facts regarding the differences between normal and subnormal children. For instance, subnormal children show limited ability to reason, to comprehend, to generalize, to concentrate, to deal with abstract ideas, and to form judgments.

Mental characteristics conditioning learning.—As the committee wished to present the positive, constructive point of view, the limitations of subnormal children were stated as mental characteristics conditioning learning; for example, the subnormal child learns to reason through a large number of concrete instances; he comprehends only subject matter within his experiences; he generalizes only

through the application of a principle or process to a large number of specific cases; he concentrates only on material that has vivid interest for him. These are only a few of the typical characteristics to be considered in planning courses of study suited to slow-learning children.

Adjustment of subject matter.—With this psychological basis, general principles for the adjustment of subject matter were considered. To meet the limited intelligence, the quantity as well as the quality of the material must be adjusted. Hence, two types of differentiation have been used: quantitative—adjusting the amount of subject matter for slow-learning children—and qualitative—adjusting the kind of subject matter.

Quantitative differentiation.—Quantitative differentiation is necessary because the slow-learning child can never learn all that the normal child can learn. The amount expected of him must be limited in accordance with his ability. A study of present and future needs, interests, and activities and of minimum essentials adapted to mental ability will determine the subject matter that should be eliminated, retained and enriched, or added. For instance, a sixteen-year-old boy with a mental age of twelve years will probably become a laborer in a humble environment, where his needs for complex fractions and five-place decimals will be nil. However, his needs for the use of simple fractions—halves and fourths—and two-place decimals will be frequent in caring for the finances of a simple household. The principle of quantitative differentiation demands that the school omit from his arithmetic training all work with complex fractions and five-place decimals but give a much greater amount of practice on simple fractions, such as halves and fourths, and two- and three-place decimals.

Qualitative differentiation.—Qualitative differentiation is necessary because the subnormal child can never make use of the same kind of education the normal child will use. The content offered him must be suited to his mental limitations. His present and future success in the community requires that he form specific habits of obedience to authority, industry, emotional control, responsibility toward home, and so forth. Leadership in civic affairs probably will be beyond his ability. Therefore, he should be trained to recognize the

advantages of following a more capable leader. However, even the individual of limited ability will meet some social and occupational situations in which he himself will exercise leadership over those in his own natural group. Hence, subject matter for the subnormal child should stress specific habits of desirable leadership in those types of activities in which he may excel. The subject matter presented to him must be within his experience; it must deal with concrete situations; it must have high interest value; it must teach specific habits; it must lead toward a vocation. It must be enriched through numerous activities and experiences that teach the subnormal child facts and information already obvious to the normal child. It must differ in quality from that offered the child of high intelligence, who will be able to form his own judgments, to initiate civic movements, and to assume leadership in the community.

Effective methods of procedure.—Effective methods of procedure for the child of limited ability must take into account his mental characteristics and limitations. The learning processes of such a child are conditioned by the limited degree to which each mental ability is present. For instance, his ability to deal with abstract ideas is limited. Hence, good method for him presents new subject matter not through abstract ideas but through concrete materials. His ability to generalize is limited. Good method therefore presents new principles not through generalization but through numerous specific instances. His ability to reason is limited. Hence, good method depends much less on rationalization but much more on habit formation and drill.

Applications of laws of learning.—For children of all abilities good method depends on the application of the laws of learning. For the child of limited ability these laws are particularly necessary. The effort of such a child is conditioned more by his interests than by his initiative or persistence. Hence, the law of readiness demands that for him activities be more carefully and frequently motivated than for the normal child. Again, the slow-learning child learns more through the formation of specific habits than through reasoning or generalization. Hence, the law of repetition demands that for him drill be used more frequently and more intensively than for the normal child. The behavior of the child of limited intelligence is gov-

erned more by his emotions than by reasoning and judgment. Hence, the law of effect demands that for him the school provide an environment that will stimulate only desirable emotions.

Adjustment of standards of attainment.—The very nature of the child of limited ability demands that standards of attainment be adjusted to his limitations. It is necessary at the outset to realize that the child of limited mental ability will be slow in his learning and that in no way can he be forced beyond the level of his capacity. Within his limits, however, he will respond to judicious and systematic training.

Mental age as basis of standards of attainment.—There can be only vexation and disappointment if the child of limited ability is compared with normal children. His attainments can never equal those of normal children of the same chronological age. He should be compared, therefore, with children of the same mental age. Mental age is an objective measure of mentality. Its significance seems to be familiar to most teachers and principals; yet it is astonishing how few apply it constructively for the purpose of determining the capacity and educational treatment of a subnormal child. Mental age expresses the degree of mental ability in years and months which is possessed by the average child of corresponding chronological age. It is the most important factor conditioning learning. For instance, a twelve-year-old child with an I.Q. of 75 has a mental age of nine years. He should not be expected to meet the standards of twelve-year-old children. He can be expected to approximate the attainments of the average nine-year-old child. The last statement, however, should be qualified in at least two respects. In the first place, while the mental age may be the same, the rate of mental growth is slower for the subnormal child than for the average child. The rate of mental growth is indicated by the intelligence quotient, which is the ratio between mental age and chronological age. For instance, the twelve-year-old child with an I.Q. of 75 should not be expected to make twelve months of mental growth in one year. He will probably make about 75 per cent of that growth, or nine months of mental growth. In the second place, as pointed out in an earlier paragraph, an I.Q. of 75 indicates the need for specific types of learning procedure regardless of mental age. The types of abilities most used

by the slow-learning child in securing information, his method of attack in solving problems, and his manner of adjusting himself to new situations differ from those of the normal child of the same mental age. Thus, in the planning of instruction and in the measuring of achievement, a constructive interpretation of both mental age and intelligence quotient provides the most reliable standards now available.

Attainment affected by total individuality.—Psychiatrists have called attention to the danger of exaggerating the purely intellectual factor in the study and treatment of handicapped individuals. The trained psychiatrist takes into account the total individuality and emphasizes the significance of personality traits. Certain contributing factors, such as physical health, irregular school attendance, personality defects, and home attitudes, may influence attainment. The teacher who expects a subnormal child to approximate standards set for normal children of the same mental age, however, will set a fair standard in most cases.

Application of principles of differentiation to arithmetic and reading.—The general principles relating to the differentiation of curriculums for children of limited ability are applicable to all academic subjects. Denver has already applied these principles to arithmetic. The tentative course of study in this subject is now being used as a working basis for classroom experimentation with slow-learning children in both regular and special rooms. At present Denver is working on the problem of differentiated instruction in reading for children of limited ability.

Publication of report on differentiated curriculums.—A monograph containing a complete report of the committee's work on differentiated courses of study for slow-learning children will be in print by February, 1930. It will consist of three parts: (1) "General Principles for Differentiation of Courses of Study for Slow-learning Children," (2) "Differentiation of Arithmetic Course of Study for the Borderline Child," and (3) "Differentiation of Reading Course of Study for the Borderline Child."

IMPROVING COMPUTATIONAL ABILITY

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This article reports the results of a remedial program in computation which was conducted by Ora Hanna in her own seventh-grade classroom in the public schools of Cedarville, Ohio. The work was undertaken as a field project in connection with an extension course in diagnostic testing and remedial teaching in which Miss Hanna was enrolled. This course was sponsored by Miami University and was conducted by the writer. The program extended over a period of twelve weeks and utilized only a part of the time allotted to arithmetic in the daily schedule. The actual time devoted to remedial work did not exceed twelve hours.

The first step in the project consisted in discovering the pupils weak in computation. A preliminary survey of the class was made by means of Scale II, Form 1, of the Monroe Standardized General Survey Arithmetic Scales. The results of this survey are presented in Table I.

An analysis of Table I in the light of the grade standards shown in Table II reveals a number of significant facts. First, the class as a whole was well above the standard for the seventh grade. Second, so far as training needs were concerned, the class comprised three well-defined groups. The first group included eleven pupils who were one or more grades above standard. The second group was composed of eight pupils who had attained the grade standard. The last group consisted of ten pupils who were below the grade standard; these pupils needed remedial help. Third, there was a wide range in ability to compute. Thus, Pupil 1 attained a score which was more than twice the scores of Pupils 27, 28, and 29.

Diagnosing the group and individual needs of the ten pupils who were below the standard for their grade comprised the second step in the remedial project. The major needs were discovered by checking the test papers in the preliminary survey. The results of the preliminary analysis are shown in Table III.

Table III shows that all the ten pupils encountered difficulty in addition, multiplication, and division and that all the pupils but one experienced difficulty in subtraction. The test data show, however, that four of the pupils had no difficulty in addition other than in number combinations and that the only error of another pupil was in the use of the wrong operation. In the case of multiplication, two pupils were found to be weak only in number combinations, and another pupil had difficulty only with the addition phase of the multiplication process.

TABLE I

SCORES OF TWENTY-NINE SEVENTH-GRADE PUPILS ON SCALE II, FORM 1, OF THE MONROE STANDARDIZED GENERAL SURVEY ARITHMETIC SCALES

Pupil	Score	Pupil	Score	Pupil	Score
1	139	12	89	23	74
2	123	13	89	24	74
3	110	14	88	25	73
4	109	15	87	26	73
5	104	16	87	27	65
6	104	17	84	28	64
7	103	18	81	29	64
8	102	19	79		
9	96	20	76	Median	87
10	95	21	76	Standard for Grade VII	79
11	94	22	75		

The third step in the remedial project consisted in determining the types of errors made by the ten pupils in the fundamental processes. Individual analysis was made possible through the use of the Buswell-John Diagnostic Test for Fundamental Processes in Arithmetic. The results are shown in Table IV. This table can be read both horizontally and vertically. When the table is read horizontally, the types of errors made by the group as a whole are easily discovered; when the table is read vertically, the types of errors made by individuals are evident.

Table IV reveals many facts of significance. First, only a few types of errors characterized the work of any considerable part of the group of pupils. The table lists twenty-one types of errors; however, if number combinations for all four processes are considered as belonging to one type, there is a total of eighteen types. Of these eighteen types, only seven appeared in the work of five or

more of the ten pupils. In the order of frequency of occurrence, these are (1) errors in number combinations, (2) errors in the multiplication phase of division, (3) errors in the subtraction phase of division, (4) errors in the addition phase of multiplication, (5) use of the long-division form for short division, (6) use of a remainder

TABLE II

GRADE STANDARDS FOR SCALE II, FORM 1, OF THE MONROE STANDARDIZED GENERAL SURVEY ARITHMETIC SCALES

Grade	Standard Score
V	52
VI	66
VII	79
VIII	91

larger than the divisor, and (7) use of the wrong fundamental process in addition. The first type accounts for 35.6 per cent of all the errors made; the first two types account for 43.6 per cent of the errors; the first three types, for 49.5 per cent; the first four types, for 55.4 per cent; the first five types, for 61.4 per cent; the first six types, for 66.3 per cent; and all seven types, for 71.3 per cent.

TABLE III

MAJOR TYPES OF COMPUTATIONAL DIFFICULTIES ENCOUNTERED BY TEN SEVENTH-GRADE PUPILS

Type of Difficulty	Pupils										Total
	20	21	22	23	24	25	26	27	28	29	
Addition	×	×	×	×	×	×	×	×	×	×	10
Subtraction	×	×	×	×	×	×	....	×	×	×	9
Multiplication	×	×	×	×	×	×	×	×	×	×	10
Division	×	×	×	×	×	×	×	×	×	×	10
Total	4	4	4	4	4	4	3	4	4	4	39

Second, all the pupils except Pupil 26 needed further training in all the fundamental operations; Pupil 26 needed training in all the operations except subtraction. Third, some of the operations were much more difficult than were others for the group as a whole. Thus, the number of type errors made by the group in division is more than twice the number made in multiplication and almost

twice the number made in addition. For the group concerned, the operations rank in the following order of difficulty: division, subtraction, addition, and multiplication. The greater complexity of

TABLE IV

TYPES OF ERRORS IN ADDITION, SUBTRACTION, MULTIPLICATION, AND DIVISION MADE BY TEN SEVENTH-GRADE PUPILS

	Pupils										Total
	20	21	22	23	24	25	26	27	28	29	
Addition:											
1. Errors in combinations	×	×	×	×	×	×	..	×	×	×	9
2. Used wrong fundamental process	..	×	..	..	×	×	×	×	..	..	5
3. Forgot to add carried number	..	..	..	..	×	×	..	..	..	..	2
4. Repeated work after partly done	..	..	..	..	..	..	..	×	×	..	2
5. Dropped back one or more tens	..	..	..	..	..	..	..	×	..	..	1
6. Unnecessary carrying	..	..	..	..	..	×	..	..	..	..	1
Number of types of errors	1	2	1	1	3	4	1	4	2	1	20
Subtraction:											
7. Errors in combinations	×	×	×	×	×	×	..	×	×	×	9
8. Did not allow for borrowing	×	..	×	×	..	..	..	×	..	..	4
9. Failed to borrow; gave zero as answer	..	..	..	×	×	×	..	×	..	..	4
10. Errors due to zero in minuend	..	×	..	..	..	×	..	..	×	×	4
11. Deducted from minuend when borrowing was unnecessary	..	×	..	..	..	×	..	..	×	..	3
12. Said example backward	..	..	×	..	..	..	..	..	..	..	1
Number of types of errors	2	3	3	3	2	4	..	3	3	2	25
Multiplication:											
13. Errors in combinations	×	×	×	×	×	×	..	×	×	×	9
14. Errors in addition	..	..	×	×	..	..	×	×	×	×	6
15. Errors due to zero in multiplier	..	×	..	..	..	×	..	×	..	..	3
Number of types of errors	1	2	2	2	1	2	1	3	2	2	18
Division:											
16. Errors in combinations	..	×	×	×	×	×	×	×	×	×	9
17. Errors in multiplication	..	×	×	×	×	×	..	×	×	×	8
18. Errors in subtraction	..	×	..	×	..	×	×	..	×	×	6
19. Used long-division form for short division	×	..	×	..	×	..	×	..	×	×	6
20. Used remainder larger than divisor	..	×	×	..	..	×	..	×	..	×	5
21. Found quotient by trial multiplication	×	..	..	×	..	..	×	..	×	..	4
Number of types of errors	2	4	4	4	3	4	4	3	5	5	38
Total number of types of errors	6	11	10	10	9	14	6	13	12	10	101

division as compared with the other fundamental processes naturally leads one to anticipate these results. Fourth, there is marked variation in the number of type errors made by the ten pupils. When

all four processes are considered, the number of type errors made by some pupils is more than twice the number made by other pupils. When the operations are considered singly, individual differences in the number of type errors made are even more pronounced. Fifth, marked individuality characterizes the types of errors that were made. Pupils 20 and 26, for example, each made six types of errors; analysis shows, however, that only two of the six type errors made by Pupil 20 were made by Pupil 26. Sixth, weakness in number combinations constituted the greatest single source of error in all the operations.

Since difficulties in number combinations constituted the outstanding weakness of the group, the Wisconsin Inventory Tests in Arithmetic were used to discover particular combinations which proved difficult for the group and for individuals. Pupil 22 said: "Eight and three is twelve; fourteen and seven is twenty-two; four and two is eight; six and nine is sixteen; six and two is seven; seven and three is eleven; nine and two is twelve; and twelve and eight is thirty-two." These errors in addition combinations are typical of those made by the other pupils in addition and in the other operations.

The last step in the project consisted in remedial instruction to overcome the pupil difficulties. For this final step all the others should be regarded as preparatory. Individual needs and difficulties dictated the course of remedial instruction, which consisted in re-teaching if the circumstances required it and in abundant practice. The work was administered, in the main, as individualized group instruction.

Individualization of the remedial work was made possible by observing certain principles of administrative procedure. In the first place, all the pupils who encountered the same type of difficulty were grouped for purposes of instruction. Reference to Table IV will show how this principle of grouping worked out in actual practice. All the pupils except Pupil 26 were organized for the mastery of difficult number combinations in addition, subtraction, and multiplication; and all pupils except Pupil 20, for the study of difficult combinations in division. Eight pupils were grouped for the mastery of difficulties in the multiplication phase of division; six pupils, for the mastery of difficulties in the addition phase of multiplication;

six pupils, for the mastery of difficulties in the subtraction phase of division; and so forth. Individualization of the remedial work was made possible, in the second place, by having each pupil within a group concentrate on his own particular difficulties. Thus, each pupil who encountered difficulties in number combinations strove to master those combinations which caused difficulty, as discovered through the use of the Wisconsin Inventory Tests in Arithmetic.

At the end of the twelve-week period of attention to computation, the pupils were retested by means of Scale II, Form 2, of the Monroe Standardized General Survey Arithmetic Scales. Table V records the amount of improvement that was made.

TABLE V

SCORES OF TEN SEVENTH-GRADE PUPILS ON SCALE II, FORMS 1 AND 2, OF THE MONROE STANDARDIZED GENERAL SURVEY ARITHMETIC SCALES

Pupil	Score on Form 1	Score on Form 2	Gain
20	76	126	50
21	76	86	10
22	75	69	− 6
23	74	84	10
24	74	87	13
25	73	91	18
26	73	96	23
27	65	57	− 8
28	64	78	14
29	64	86	22
Median	73.5	86	13.5
Average	71.4	86	14.6

Table V reveals a number of interesting facts. First, marked improvement was made by the group as a whole, the average gain being 20.4 per cent. Interpreted in terms of grade standards (Table II), the gain amounts to about one full grade. Second, seven of the ten pupils attained the grade standard in the retest, and another pupil was only one point below the standard. Third, the pupils varied greatly in amount of individual improvement. Fourth, two of the pupils made lower scores in the retest than in the pretest. This loss in achievement may be explained in part by the low intelligence level of the pupils concerned, their I.Q.'s being 75 and 73, respectively.

THE SELECTION OF SUPPLEMENTARY BOOKS FOR USE IN THE ELEMENTARY SCHOOLS OF LOS ANGELES

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One of the important problems in any school system is the selection of books. This problem can best be solved when the various departments concerned with the work of the classroom make the contributions afforded by their respective points of view.

Librarians, from the very nature of their selection and from their training, know the literary quality of books. They are constantly informed, too, of new trade materials, book projects, authorized lists, and promising authors. Public librarians have an insight into the undirected reading in the children's room.

The supervisors of special subjects—nature-study, music, agriculture, and others—have a detailed knowledge of the authenticity of books touching their several fields. The artistic quality of illustrations can best be judged by the art department.

The strong and superior teacher who has daily contact with children's interests, their varying reading abilities, their language handicaps, and their vocabulary difficulties brings a very practical point of view to bear on the problem.

To all these points of view valuable in the selection of books, the general supervisor brings in varying proportions something of each one. Her training should have given her some feeling for literary merit in books, but it is probably not equal to that of the librarian.

As the supervisor demonstrates lessons throughout the city with all types of children, she becomes sensitive to the inadequacies and the excellencies of books for inducing learning. She becomes acutely conscious of the necessity of providing easy concrete reading material for foreign and slow reading groups. She is, in fact, willing to

lower her standards of literary quality if necessary in order to provide such material, though not below a certain minimum. The supervisor knows the course of study, and she knows, too, that an activity cannot be carried on successfully if it is not supported by enough books of the right kind.

The development of an activity program affects the selection of books both because of the kind of books needed and because of the ways in which they are used. Teaching by means of activities has made it necessary to supply quantities of informational material on many subjects. Problem-solving, individual reports, and emphasis on enrichment make it necessary to supply material to a given classroom in small sets and single copies rather than in uniform large sets. Books which provide for very high or very low reading ability or meet a specialized interest may be sent to the classrooms in sets of five. Books which support the course of study strongly can best be used in sets of twenty. Single copies of books for the browsing table and reference books are adequate.

The following is a description of the procedure used in selecting books for the elementary schools in Los Angeles. It does not apply to the basic textbooks provided by the state of California in the subjects of arithmetic, reading, language, spelling, geography, and history. It does apply to the many thousands of books purchased annually by the city to supplement the state textbooks. The books referred to in the discussion are those used in connection with the academic subjects in Grades III–VI and in those seventh and eighth grades which are not a part of the junior high school organization. The discussion applies more particularly to new books.

No book is ordered without a careful examination by supervisors of the course of study and by city school librarians.

The problem of securing books for examination has been simplified for the supervisors in several ways. Every day the City School Library sends to the office of the Division of Course of Study a reference librarian who lists the requests of the various supervisors. In making a request, a supervisor may ask for a specific title or for books on a certain subject or topic. The books are secured from the City School Library or the Los Angeles Public Library and sent to the office of the Division of Course of Study later in the day. This

library service multiplies many times the efficiency of the supervisors in solving the book problem. The City School Library also sends copies of new trade books which it has received. Book companies are most generous in lending copies of both school and trade books.

There are several sources from which the supervisors secure titles as a basis for their requests. There are in print a number of lists of books compiled and classified from various points of view. Lists in current magazines are made use of constantly. Advertisements in good magazines are often suggestive. Book reviews give some idea of the content of books, but it is always necessary for the supervisors to read the books in the light of the instructional purposes.

After a book comes to the office of the Division of Course of Study, it receives critical examination by several supervisors. In the division there are three supervisors of the third and fourth grades, three supervisors of the fifth and sixth grades, one supervisor of the seventh and eighth grades, and a director. A book is first examined by the supervisor who requested it in order that she may judge whether it is of sufficient merit to receive the attention of other members of the staff. If the book has merit, she determines the level of reading ability for which it is most appropriate and places it in the hands of one or two other supervisors to whose work it seems best to apply. Each supervisor keeps a record of her impression of the book. No particular form is followed in this record. A standardized card might give comprehensive data on the objective features of a book, but often the values which place books high or low are intangible and individual.

The following are notes made by two supervisors on four books.

BOOK 1

Supervisor A.—The introductory sketch of each country is excellent. The fairy lore is delightful. A very good book for the sixth grade. France—Spain—Russia—Italy—Persia—Serbia.

Supervisor B.—Fairy tales of different countries with a discussion of each country for the teacher. Good for world-friendliness. France, Russia, Spain, Italy, Persia, Serbia. Simple.

BOOK 2

Supervisor A.—Well written. The people seem very real. Detail nice; as making brass bowls, the farm, the market of Luxor.

Supervisor B.—Good in showing the life of the people—what they eat, what work the children do, how they are educated, life on a farm, interior of the houses. Pictures not very effective.

BOOK 3

Supervisor A.—Interesting, straightforward, bare historical facts on the evolution of flying. Colorful pictures. Short paragraphs on each page—small print. Interesting reference—encyclopedic and sketchy.

Supervisor B.—Largely historical. Full of facts: dates, distances, places; written like a catalogue. Print becomes hard on one's eyes as one reads. Compares poorly with Jacobs.

BOOK 4

Supervisor A.—Story of a goat—introduces a number of geographic concepts; for example, What is a timber line, and why? Gives information on other animals found in mountain regions. Story form—for browsing table for the fourth grade.

Supervisor B.—A delightful story of a goat. Much too difficult for the third grade and the beginning fourth grade. Recreational material.

Estimating the reading level at which a book may be most successfully used is perhaps the most difficult problem and the one least satisfactorily solved. Before any book is purchased in large quantities, it is tried out in classrooms. Formulas for estimating reading difficulties are not used except in very special cases. Any scheme to estimate the reading difficulties of a book that requires a day or even less of a busy supervisor's time is of limited use.

If a book is concerned with subject matter in science, art, agriculture, or a similar field, it is sent to the department in charge of that work or to experts outside the school department for examination as to authenticity.

The organization of the course of study on an activity basis has centered the selection of books about units of interest, such as China, aviation, Indians, and petroleum. Throughout the year, as the units are developed, the supervisors make very careful analyses as to the amount of material relating to each unit. For example, for the study of China in the third grade, nine books were examined. These books were analyzed to discover which books give the greatest number of concrete facts about the Chinese. Usually such an analysis is made in terms of pages.

From the point of view of problem-solving, the most valuable

book is the one which gives the largest amount of reliable information. Other considerations are literary value, story interest, and reading level.

The examination of books is a continuous process. Throughout the year there are consultations of supervisors with librarians and exchange of ideas. After the supervisors have prepared a tentative list for the spring book order, they have a preliminary consultation with the librarians. In this discussion the supervisors outline their policies for the next year and the reasons for certain requests. In a rough way the number of books is estimated. The librarians discuss with the supervisors the demands that come directly to the library from teachers and principals. Together the librarians and the supervisors arrive at a general agreement as to the number of copies of each book to be ordered. The supervisors' list is revised in the light of the discussion, and a final meeting of supervisors and librarians is held for the purpose of a clear understanding of all changes. Any books on the merits of which the supervisors and the librarians disagree are given a second examination and further joint discussion. The final list is approved by the director of the course of study and sent to the director of the City School Library.

The list of books which is submitted to the director of the City School Library is organized under the following headings: unit lists, social studies and reading material, reference books, poetry, and recreational books. This list indicates the number of copies of each book which are to be reserved in the stock room for the disposal of the supervisors as they develop activities with certain teachers.

The unit lists include the titles of books which are to be used in various ways by the teacher in developing an activity program about a given topic. The titles are organized under the following headings: basic book, books to be sent to the teacher in sets of five to supplement the basic book, single copies for reference, and single copies for recreational reading to accompany the unit.

The list of books classified as social studies and reading material includes any books that will supplement the social studies in a more general way than do the books in the unit lists. It applies more largely to the upper grades. The list indicates whether the books are to be used as permanent sets, one-month sets, or single copies.

The reference books include not only standard encyclopedias but books which give valuable additional information on the units of instruction but are not suitable for general reading.

Volumes of poetry appropriate to the different grade levels and larger collections make up the list of books of poetry.

The list of recreational books includes attractive books on a variety of subjects which are appropriate for the browsing tables and book shelves provided in the classrooms.

There are a number of problems with regard to the selection of supplementary books which confront the supervisors in Los Angeles. There is an increasing need for more objective techniques for use in judging textbooks; for example, a fairly mechanical method of determining the reading level of a book that does not require a large amount of the supervisor's time is needed. One method is being developed by a member of the Research Division of the Los Angeles city schools.

At present inappropriate books receive too much consideration. Some method of eliminating such books more quickly is needed. There is also at present no certainty that every new book reaches the Division of Course of Study. Some comprehensive plan must be worked out by which all new books will be available for examination.

One thing is apparent from the continuous study of books in Los Angeles. There is need for a great amount of reading material for classroom use which is more adequate in quality and richness of content. A few books stand out for their excellent content, simplicity, good print, and attractive makeup.

The new philosophy of education has brought about a new way of using books. Many books on many subjects are needed. Indeed, so imperative is the need that teachers' colleges and schools of education might very properly organize courses and departments to make an intensive, comprehensive study of the problem with a view to making more extensive contributions. Such a course ought to be one of the requirements in every supervisor's training.

A COMPARATIVE STUDY OF THE EFFECTS OF DIFFERENT TYPES OF SCHOOL-BUILDING VENTILATION ON THE HEALTH OF PUPILS. II

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CHARACTERISTICS OF THE PUPIL POPULATION AND THEIR RELATION TO ABSENCE DUE TO RESPIRATORY ILLNESS

The first article in the series of which this is a part presented data showing that in an investigation carried on in schools in Oak Park, Forest Park, and Maywood, Illinois, during the school year 1927–28, the percentage of absence due to respiratory illness was greater in schools having mechanical ventilation than in schools having natural or window ventilation and also pointed out that this result agrees with the results of several other studies of school ventilation. These earlier studies have indicated that certain factors influence the rate of absence due to respiratory illness. Among these factors are certain personal characteristics of the pupil population. An effort was made in organizing the present study to include schools the pupil populations of which were as nearly alike as possible with respect to these personal characteristics in order to eliminate any effect which they might have on the conclusions reached. However, it was not found possible to obtain altogether parallel groups in the case of some of the characteristics. Consequently, it was considered desirable to determine as nearly as possible the effect of each characteristic on the result. The following data were obtained for each pupil included in the study: age, grade, sex, nationality, nationality of parents, and occupation of father or guardian. A pupil was classified as American if he and at least one of his parents were born in this country. If both of his parents were foreign born or if the child was foreign born, he was designated as not American. The occupations of the parents or guardians were classified accord-

ing to Taussig's five-grade classification, as follows: (1) common laborer, (2) slightly skilled to semi-skilled laborer, (3) skilled laborer, (4) semi-professional and business, (5) professional.

For each room included in the study and for each type of ventilation the following data were determined: (1) average age, (2) percentage of boys, (3) percentage of American pupils, and (4) occupational index. The grade was also indicated for each room. The occupational index was obtained by assigning a numerical value to each occupational level—common laborer, 1; slightly skilled to semi-skilled laborer, 2; etc.—and averaging the scores for the pupils in the room or group. The four types of data were determined

TABLE V

COMPARISON OF PERSONAL CHARACTERISTICS OF PUPILS IN ROOMS HAVING NATURAL VENTILATION AND PUPILS IN ROOMS HAVING MECHANICAL VENTILATION DURING THE TWO SEMESTERS OF THE SCHOOL YEAR 1927–28

	Percentage of Absence Due to Respiratory Illness	Average Age	Percentage of Boys	Percentage of American Pupils	Occupational Index
Natural ventilation:					
First semester	2.09	9.78	49.1	74.5	3.12
Second semester	2.65	9.85	49.0	75.0	3.10
Mechanical ventilation:					
First semester	3.07	9.66	50.5	90.1	3.61
Second semester	4.37	9.67	49.9	88.6	3.64

for each group for each of the two semesters since many of the rooms contained wholly or partly different groups of pupils during the two semesters. Table V presents the results for the two types of ventilation. The percentage of absence due to respiratory illness is included for reference. Since there are differences between the data for the two types of ventilation in the case of some of the items, it is important to determine whether the differences are significant and the influence each of the factors has on the result.

In order to determine the importance of the various factors, the percentage of absence due to respiratory illness for the individual rooms was correlated with each of the other items. Correlations were obtained for each semester and for each type of ventilation. The coefficients of correlation are presented in Table VI.

RELATION BETWEEN ABSENCE DUE TO RESPIRATORY ILLNESS AND AGE OR GRADE

Table VI shows that the amount of absence due to respiratory illness varies significantly with the age of the pupils whether this is expressed in terms of the grade in the particular room or in terms of the average age of the pupils in the room. In the case of both age and grade the correlations range from about −.30 to about −.55. The fact that the correlations are negative indicates that the younger pupils were absent because of respiratory illness more frequently

TABLE VI

CORRELATION BETWEEN THE PERCENTAGE OF ABSENCE DUE TO RESPIRATORY ILLNESS AND PERSONAL CHARACTERISTICS OF PUPILS IN ROOMS HAVING NATURAL VENTILATION AND ROOMS HAVING MECHANICAL VENTILATION DURING THE TWO SEMESTERS OF THE SCHOOL YEAR 1927–28

	Average Age	Grade	Percentage of Boys	Percentage of American Pupils	Occupational Index
Natural ventilation:					
First semester	−.459	−.491	−.165	.300	.133
Second semester	−.356	−.299	−.033	.323	.069
Mechanical ventilation:					
First semester	−.531	−.556	−.001	.092	.063
Second semester	−.363	−.369	.074	.238	.116
All rooms:					
First semester	−.529	−.538	−.049	.338	.301
Second semester	−.381	−.339	.073	.351	.302

than were the older pupils. Decrease in amount of absence due to respiratory illness with increase in age is indicated also by a comparison of the percentages of absence due to respiratory illness for the different grades for the year, as presented in Table VII. The line marked "Grades II–VI" gives the percentage of absence due to respiratory illness for each type of ventilation based on the total number of pupil sessions. In order to eliminate any differences between types of ventilation which might be due to the fact that the distributions of pupils among the various grades were not the same in all cases, the average percentage was also computed for each type. It will be observed that the naturally ventilated rooms still have lower percentages of absence due to respiratory illness than do the mechanically ventilated rooms and that the lowest percentage is that for the rooms ventilated by the window-gravity

method. Table VII shows that the percentage of absence in the second grade due to respiratory illness is considerably lower in the case of the window-gravity type of ventilation than in the case of the other types of ventilation. The average percentage was therefore calculated for each type of ventilation for Grades III–VI, inclusive. The percentages indicate that the types of ventilation maintain the same relative positions when only the four grades are included that they hold when the five grades are included with the exception that the split type and the indirect type exchange places.

TABLE VII

PERCENTAGE OF ABSENCE DUE TO RESPIRATORY ILLNESS BY GRADES UNDER FOUR TYPES OF VENTILATION FOR SCHOOL YEAR 1927–28

GRADE	NATURAL VENTILATION			MECHANICAL VENTILATION		
	Window-Gravity Ventilation	Window-Window Ventilation	Total	Split-System Ventilation	Indirect Ventilation	Total
II	2.22	4.21	3.59	6.94	6.34	6.66
III	2.12	3.57	2.63	3.27	3.94	3.55
IV	2.08	2.14	2.12	3.40	3.38	3.39
V	2.26	2.32	2.30	3.19	2.49	2.88
VI	1.40	2.29	1.71	3.24	3.55	3.29
Grades II–VI	1.97	2.93	2.40	3.92	3.82	3.88
Average for Grades II–VI	2.02	2.91	2.47	4.01	3.94	3.95
Average for Grades III–VI	1.97	2.58	2.19	3.28	3.34	3.28

Table V shows that there is a difference in average age between the pupils in the naturally ventilated rooms and the pupils in the mechanically ventilated rooms. When the probable errors were computed, the difference was found to be statistically significant. It was considered desirable, therefore, to determine whether or not the difference is sufficiently large to account for any material part of the difference in percentages of absence due to respiratory illness. The regression equation giving the relation between these two factors was computed and found to be: $X = -.712Y - 3.165$, where X stands for the percentage of absence due to respiratory illness and Y for age. In other words, an increase of one year in average age represents a decrease of .712 in percentage of absence due to

respiratory illness. The difference in age between the pupils in the rooms having the two types of ventilation in the second semester is .18 years; this difference, therefore, could be responsible for a decrease of only .712×.18, or .128, in percentage of absence due to respiratory illness. Since the difference is 1.72, or 13.4 times as large as the decrease which could possibly be due to difference in age, it is readily seen that, although the difference in age is statistically significant, it is not responsible for any material part of the difference in percentages of absence due to respiratory illness.

RELATION BETWEEN ABSENCE DUE TO RESPIRATORY ILLNESS AND SEX

Table VI shows that the correlation between the percentage of boys and the percentage of absence due to respiratory illness is not significant. The range in percentage of boys in the various rooms is from 18.2 in one case to 77.2 in another case. This range ought to be large enough to bring out the relation if there were any. Since there is no significant difference between the percentages of boys in the rooms having the two types of ventilation and since there is no correlation between the percentage of boys and the percentage of absence due to respiratory illness, the percentage of boys can be dismissed as having no influence in this study.

RELATION BETWEEN ABSENCE DUE TO RESPIRATORY ILLNESS AND NATIONALITY

Table V reveals the fact that there is a rather decided difference between the rooms having the two types of ventilation in the percentage of American pupils. This difference was found to be statistically significant. Table VI indicates that there is a somewhat significant correlation between the percentage of American pupils and the percentage of absence due to respiratory illness. This relation has been observed in similar studies. American children seem to be absent from school more frequently because of respiratory illness than are foreign children. It has been suggested elsewhere that American parents are more likely to keep their children out of school for minor respiratory illnesses than are foreign parents. Another possibility is that foreign children are somewhat older than are American children in the same grade. In order to test this

hypothesis, the correlation between the percentage of American pupils and age was computed for the first semester. The correlation was found to be −.216, which evidently indicates a slightly significant correlation. It is interesting, therefore, to compute the partial correlation between the percentage of American pupils and the percentage of absence due to respiratory illness with age held constant. The three correlations involved and the partial correlation are as follows: percentage of absence due to respiratory illness and percentage of American pupils, .338; percentage of absence due to respiratory illness and age, −.529; percentage of American pupils and age, −.216; percentage of absence due to respiratory illness and percentage of American pupils, age held constant, .275. The coefficient of partial correlation thus obtained indicates that there is at least some truth in the theory that foreign children are somewhat older than are American children in the same grade and that, therefore, some of the influence of nationality may be discounted as being due to difference in age.

There is one other line of attack which may make possible at least a partial evaluation of the importance of the factor of nationality in the present study. It must be granted that there is a somewhat significant relation between this factor and absence due to respiratory illness and that there is a somewhat significant difference between the naturally ventilated rooms and the mechanically ventilated rooms with regard to this factor. The question remains whether or not there is a significant difference between the two types of rooms in percentage of absence due to respiratory illness when rooms with approximately the same percentages of American pupils are compared. In order to obtain an answer to this question, all mechanically ventilated rooms with less than 90 per cent American pupils were put in one group. In another group were placed all naturally ventilated rooms with 80 per cent or more American pupils. In each case this procedure practically amounts to including the rooms with from 80 to 90 per cent American pupils. Table VIII presents the data for these restricted groups, giving in each case the percentage of American pupils and the percentage of absence due to respiratory illness for each grade and for the group. In each semester the naturally ventilated rooms had both a higher percentage of American pupils and a lower percentage of absence due to

respiratory illness than did the mechanically ventilated rooms with which they were compared. It is thus seen that the difference in nationality could not have been responsible for any significant part of the difference in percentage of absence due to respiratory illness between the naturally ventilated rooms and the mechanically ven-

TABLE VIII

PERCENTAGE OF AMERICAN PUPILS AND PERCENTAGE OF ABSENCE DUE TO RESPIRATORY ILLNESS IN NATURALLY VENTILATED ROOMS WITH 80 PER CENT OR MORE AMERICAN PUPILS AND IN MECHANICALLY VENTILATED ROOMS WITH LESS THAN 90 PER CENT AMERICAN PUPILS DURING THE TWO SEMESTERS OF THE SCHOOL YEAR 1927–28

GRADE	NATURAL VENTILATION		MECHANICAL VENTILATION	
	Percentage of American Pupils	Percentage of Absence Due to Respiratory Illness	Percentage of American Pupils	Percentage of Absence Due to Respiratory Illness
	First Semester			
II	86.3	4.82	84.2	7.78
III	86.1	3.16	82.9	2.81
IV	87.8	1.77	81.6	3.79
V	84.2	0.96	80.6	1.76
VI	86.6	1.36	84.4	4.77
Grades II–VI	86.1	2.38	82.4	3.31
	Second Semester			
II	86.1	3.50	86.7	11.02
III	86.1	3.95	85.5	3.31
IV	84.6	2.18	83.7	3.13
V	82.6	2.81	80.9	3.11
VI	85.0	2.95	85.4	3.31
Grades II–VI	84.7	2.95	84.0	3.81

tilated rooms included in this study. If nationality were a truly important factor, one would expect the percentages of absence due to respiratory illness for the two selected groups to be practically the same.

RELATION BETWEEN ABSENCE DUE TO RESPIRATORY ILLNESS AND OCCUPATIONAL STATUS

Table V reveals the fact that there is a considerable difference between the occupational indexes of the naturally ventilated rooms

and the mechanically ventilated rooms. A computation of the probable error of this difference reveals the fact that the difference is significant. The last column in Table VI, which shows the correlation between the occupational index and the percentage of absence due to respiratory illness, presents some results which evidently need to be evaluated. For all rooms combined the coefficient of correlation is .301 for the first semester and .302 for the second semester. These coefficients would appear to indicate a significant correlation. There is, however, one consideration which must not be overlooked. Both low percentage of absence due to respiratory illness and low occupational index are found in the case of the naturally ventilated rooms, while high percentage of absence due to respiratory illness and high occupational index are found in the case of the mechanically ventilated rooms. The occupational index may therefore be a significant factor, or its relation to absence due to respiratory illness may be merely accidental. If it is truly significant, there should be a similar relation between this factor and the percentage of absence due to respiratory illness for each type of ventilation as well as for all rooms combined. As it happens, the correlation for each of the two types of ventilation is insignificant. For the first semester the coefficients for the naturally ventilated rooms and the mechanically ventilated rooms are .133 and .063, respectively. For the second semester the coefficients are .069 and .116, respectively. The fact that these correlations are insignificant would indicate that the occupational index is not a significant factor in determining percentage of absence due to respiratory illness but stands only in accidental relation to it; that is, it simply happened that the rooms having natural ventilation have a lower occupational index. If there were any significant relation, it should be present within the separate groups as well as in the total group.

CONCLUSIONS

The following conclusions may be drawn concerning the relation between absence due to respiratory illness and the various characteristics of the pupil population considered in this article.

1. Absence due to respiratory illness is significantly related to age, the younger pupils having higher percentages of absence due to respiratory illness.

2. Absence due to respiratory illness is significantly related to grade, the lower grades having higher percentages of absence due to respiratory illness.

3. The difference between the average ages of the pupils in the rooms having the different types of ventilation is apparently not sufficient to have caused any significant part of the difference in percentages of absence due to respiratory illness.

4. The factor of sex as expressed in terms of the percentage of boys has no apparent relation to absence due to respiratory illness.

5. There is a significant correlation between nationality as expressed in terms of the percentage of American pupils and absence due to respiratory illness. The correlation is somewhat reduced when age is held constant.

6. The difference in nationality between the pupils in the rooms having the two types of ventilation is evidently not sufficient to have caused any considerable part of the difference in percentages of absence due to respiratory illness.

7. Although the factor of occupational status apparently has considerable relation to absence due to respiratory illness when all rooms are combined, there is no relation when the two types of ventilation are considered separately. This fact would indicate that the relation is accidental, not real.

8. The general conclusion from the data here presented must be that, although the pupils in the rooms having natural ventilation differed in certain important respects from the pupils in the rooms having mechanical ventilation and although a few of the factors are undoubtedly related to absence due to respiratory illness, the difference is not enough in any case to account for any material part of the larger percentage of absence due to respiratory illness in the case of the pupils in the mechanically ventilated rooms.

[*To be concluded*]

HOW ORAL READING WAS IMPROVED THROUGH THE USE OF GRAY'S CHECK TESTS

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Within recent years the pendulum has swung rather far in the direction of silent reading, perhaps to the detriment of oral reading. The question is frequently raised by parents, Sunday-school and social workers, and college instructors as to why young people are deficient in oral reading. It has occurred to the writers that the poor pronunciation and enunciation as well as the meager vocabulary noticeable among the majority of young people who have had school advantages might be attributed in part to the fact that formal instruction in oral reading fails to provide specific training. Close observation of the average silent-reading lesson would lead one to conclude that there should be much more oral reading for the purpose of checking silent reading. Many pupils who comprehend well when they read silently pronounce and enunciate very poorly when they read orally.

It was for the purpose of improving the oral reading of the pupils in the training school of the Western Carolina Teachers College, of determining the methods and materials of instruction which are most effective, and of giving an opportunity to do laboratory work to about one hundred prospective teachers that oral reading was made a subject of special study during the winter and spring quarters of the school year 1928–29. In a conference with the critic teachers, it was decided to use Gray's Standardized Oral Reading Check Tests as a diagnostic basis for remedial work.

Since the individual record sheet accompanying these tests proved to be more analytical than was necessary, a modified form, including eight major factors in oral-reading ability, was agreed upon. The initial tests were given to 170 pupils in January by the critic teachers in Grades II–VII, inclusive. Forms 1 and 2 were given in March and May, respectively. Individual graphs were

made of the results at each time, showing the number of non-recognitions, mispronunciations, poor enunciations, substitutions, insertions, omissions, repetitions, and miscellaneous errors. Composite graphs showing grade improvement were also made.

According to the results of the tests as revealed in the graphs, it was clear that the difficulty in all grades was primarily word recognition and pronunciation. Since there is only a slight difference between the ability to recognize words and the ability to pronounce words, it seemed that the same remedial measures should result in improvement in both.

The first points of attack in the remedial work were syllabication and phonetics. These principles were emphasized during the spelling or word-drill period. A syllable consciousness was secured through the division of words into syllables in a variety of exercises. Methods were used which developed both visual and auditory powers. Phonetics was stressed in all grades according to the requirements of the course of study and the abilities of the pupils. Diacritical marks and the sounds of the vowels were stressed in the sixth and seventh grades. Specific training was given in the use of the dictionary in Grades IV–VII, independence on the part of the pupil being the goal. Syllabication and phonetics were made to function in a very practical way in the preparation of material for oral reading. Considerable attention was given to prefixes and suffixes in the upper grades. The ten common rules of pronunciation were taught incidentally. The pupils were checked daily on the eight factors in oral-reading ability according to the standards agreed on until they became conscious of these factors.

Oral reading was motivated by providing audience situations, some of which were individual and group reading in the classroom and the reading of special selections by individual pupils before college classes. That pupils like to read orally in both mechanical and audience situations was indicated by the genuine interest which was aroused. Of course, much silent reading of both the work and the recreatory types was done, but the desire to read orally was always expressed during the regular reading period.

Materials suitable for oral reading were carefully chosen. Both selections including conversation and descriptive writing proved

valuable in all grades. For example, *Heidi* was unusually interesting reading matter in the fifth grade on account of the vivid description and the colorful words, which challenged the ability of the pupils to recognize them and pronounce them correctly. Material of an oratorical nature is always good for oral reading. Such selections as "Spartacus to the Gladiators," "The Supposed Speech of John Adams," and "Patrick Henry's Speech" were enjoyed in the seventh grade. Here, too, Antony's oration from *Julius Caesar* was read by parts and proved very suitable. The books which the pupils read for recreation were utilized in audience-reading periods. At least one period a week was devoted to this type of reading.

TABLE I

AVERAGE NUMBER OF ERRORS PER PUPIL MADE BY EACH GRADE IN JANUARY AND MAY, AMOUNT AND PERCENTAGE OF DECREASE, AND STANDARD

Grade	January	May	Decrease	Percentage of Decrease	Mid-Year Standard
II	12	7	5	42	6*
III	5	4	1	20	3*
IV	16	9	7	44	6†
V	13	7	6	46	4†
VI	28	14	14	50	6‡
VII	16	10	6	38	5‡

* Set II. † Set III. ‡ Set IV.

Numerous selections were chosen in the upper grades specifically for vocabulary work.

The outcomes of the study would seem to justify the effort. Several subjective values were evident. First, the pupils themselves were made conscious of the specific abilities necessary for good oral reading and had their ambition aroused to improve. Second, the student teachers who were assisting with the work in the training school as well as those taking the course in tests and measurements in the college were enabled to realize the standards requisite for good oral reading and to learn something of the techniques, methods, and devices by means of which these standards may be attained. Third, some effect on silent reading was evident. While more emphasis was given to oral reading than to silent reading, Grades II, III, and V were up to standard in silent reading, and the other grades were approximately up to standard.

Table I shows that the average number of errors per pupil was reduced 50 per cent in the sixth grade. As would be expected, the largest percentages of improvement are found in those grades which varied most from the standards. Table II shows that the average

TABLE II

AVERAGE NUMBER OF SECONDS PER PUPIL REQUIRED BY EACH GRADE IN JANUARY AND MAY, AMOUNT AND PERCENTAGE OF DECREASE, AND STANDARD

Grade	January	May	Decrease	Percentage of Decrease	Mid-Year Standard
II	106	91	15	14	112*
III	72	63	9	13	63*
IV	110	107	3	3	78†
V	100	82	18	18	58†
VI	137	121	16	12	69‡
VII	94	87	7	7	64‡

* Set II. † Set III. ‡ Set IV.

number of seconds required per pupil was reduced 18 per cent in the fifth grade.

In the light of the facts presented and the standards for the various grades, it is evident that further work can be carried on profitably to bring the children up to standard both in number of errors and in rate. It is the plan of the writers to continue the project during the school year 1929–30.

THE EDUCATION OF FRAIL CHILDREN

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This article is a summary of the work done during one semester in an open-air room in Los Angeles. Twenty children, ranging in age from seven to thirteen years and in grade from II A to VI A, were enrolled. The children were foreign, predominantly Mexican and Italian. Each child had been assigned to the open-air room because of some physical condition which could be improved or arrested by a school program of which rest was an essential part.

The program followed was flexible. Social studies, language, and literature were the subjects studied during the morning. A thirty-minute rest period preceded the lunch hour. At one o'clock the children had another rest period of a half-hour. The second rest period was followed by an appreciation period, during which stories or poems were read to the children, or lantern slides and motion pictures on topics discussed in the social-science period were shown. The last hour of the day was a drill period. This was used for drill in spelling, drill in the fundamentals of arithmetic, word drills, or language lessons. The drills were based on the needs of the children as discovered in the morning's work.

It was decided that the education in this room should be carried on by means of an activity program because it was felt that the experience of learning should be enjoyable. In order to launch such a program, a certain amount of preparation was necessary. This involved attention to the physical arrangement of the room and the development of a wholesome attitude in the children toward their work.

The room was equipped with movable chairs and tables. Window boxes filled with plants were placed along the open side of the room. Rubber plants and ferns were placed in various parts of the room to make it attractive. There were an aquarium and a canary, which had been given to the children by two supervisors. In every way possible the room was made to look attractive and homelike.

It was necessary to create within each child a sense of pride in his room and a feeling of responsibility for his own conduct in relation to his fellow-pupils. Above all, it was necessary to develop ability to work with others toward a common goal if an activity program which was worth while was to be carried out.

The children were allowed to choose their own monitors and to suggest the duties for these monitors. They were thus led to feel that their room belonged to them and that they were responsible for keeping it neat and attractive. The older children were given the privilege of helping the younger ones; they were thus brought to recognize the value of a contribution made by a younger child to a group activity. The children were encouraged to make suggestions for the betterment of conditions in their room. All these activities brought about a spirit of co-operation and an appreciation of the contributions of individuals within the group.

Undue excitement and overstimulation were avoided because children who are not quite normal physically are often easily excited and consequently expend a great deal of energy without any real benefit.

The activities carried out during the semester naturally arose from the interest of the pupils in the national air races held in Los Angeles. The teacher placed pictures of some of the events on the bulletin board. The children themselves brought pictures, and interesting discussions were started. Finally, one child suggested that the group have an air meet of its own. The other children thought well of the suggestion. After discussing what they might do, the children came to the conclusion that an international air meet would be better than a national meet because people from all over the world could be included. The children decided to start airplanes from different countries. They also thought that, if a child started an airplane from a country, he must know all about that country. Someone suggested that stories about what they learned of other countries might be written and put in a book.

It was decided that the air meet should be held at Mexico City and that the field should be called "Carranza Field" in honor of Mexico's "Lindy."

In a class discussion it was decided that the boys should make

the airplanes and build the field, which was to be in one corner of the room, and that the girls should dress dolls to represent the people who were attending the races.

The children divided into groups, which were naturally determined by the interest of the children in the parts of the world from which they were to start their airplanes. The groups met jointly or separately as occasion demanded. The smaller children did not care about starting from any place; they wanted to make parachutes and were allowed to do so. They found out at home and from their friends what materials were used in making parachutes; as a result, they enjoyed hearing stories about the manufacture and use of silk and linen and seeing pictures on these subjects. Samples of silk and linen were brought to school, and silk was unwound from a cocoon. Stories of child life in China, Japan, and Holland were read by the children, and motion pictures and lantern slides were shown to them. The children wrote short paragraphs about the little people of other lands.

The children became so interested in the stories and pictures that they drew and painted pictures of the things they enjoyed most. They especially liked to know what the children in other countries ate and whether or not they were clean.

One child suggested that they might have a toy store and put their parachutes in it. Parachutes, airplanes, clay dishes, and toy furniture were made and then bought and sold over the counter of the toy shop. The children learned in an enjoyable manner much about money, addition, subtraction, and multiplication. They even asked to make drill cards so that they would know how to multiply.

Their lessons in spelling were based on the words they misspelled in their stories.

There were three groups besides the primary group. One group decided to start airplanes from cities in California. This group became interested in the history and geography of California. The children read stories of the early Indians and Mission Fathers and made maps showing the cities from which they were starting and also El Camino Real, a road connecting the California Missions.

Another group chose to start airplanes from other places in North America. This choice, of course, led back to early life, even to

explorations and to such topics as the pony express, travel, inventions, and customs in Colonial times.

It would be impossible in a short space to tell all the activities which resulted, but the work in the fourth group was especially interesting. This group decided to start airplanes from Europe. The first airplane was to be started from Berlin. Such topics as these were discussed: the reason why Germany is a great manufacturing country (through magazines the children discovered the progress of Germany in the manufacture of airplanes); the kind of people the modern Germans descended from; and the life of the ancient Germans, including wars, dress, homes, sanitation, and health. The children were exceedingly interested in ancient methods of warfare and contrasted them with the present method. Such questions as these were asked: Who invented gunpowder? How is it made? When was it first made? When gunpowder was invented, how did it change things? Histories, geographies, and encyclopedias were searched to find the answers to the questions.

One of the children in this group was Italian; consequently, it was decided to start another airplane from Italy. Rome was to be the starting-place because Rome is the capital of Italy. The children enjoyed reading the story of the founding of Rome, the story of Garibaldi, and stories of the beautiful city of Venice and the ancient life of Rome. They also read *Pinocchio* in connection with their study of Italy. They read in the newspapers about Vesuvius, and a discussion of volcanoes, their cause and results, followed.

The Italian child gave interesting accounts of peasant life in Italy.

A motion picture on Northern Italy and flat pictures and stereographs of different parts of Italy were shown to the children.

This group next started an airplane from England. The children chose London because it is a large city. The teacher told the children about Croyden Field and the difficulties the English have because of fog and how these difficulties are overcome. Folders showing the air lines from Croyden Field to the continent were brought to school, and the children enjoyed looking at them. The study of England resulted in a study of knighthood and castle life. The teacher started to read the story of Robin Hood to the class; the children became

so interested that they finished the story themselves. One boy had seen the story in pictures; he was delighted because he could tell the other children something that they did not know. Poems by English poets were read to the children. They especially enjoyed "Under the Greenwood Tree" by Shakespeare.

A new boy in the group wanted to start an airplane from Paris, and the other children helped him get his material ready.

In connection with the studies made by this group, pictures were shown of the following places and topics: Berlin, Hamburg, Naples, Venice, Rome, London, English rural life, mining, ship-building, and the Cornish coast.

The children made interesting comparisons between the sky-scrapers of New York and the beautifully ornamented but lower buildings of medieval times in England. They enjoyed the pictures of cathedrals, Parliament buildings, Westminster Abbey, the home of Shakespeare, and Ann Hathaway's cottage.

Working together as a class, the children followed the new developments in the field of aviation by reading magazines and news papers. They were interested in the stories of the early trials and failures of the Wright brothers. They studied the lives of noted pilots, such as Byrd, Lindbergh, Nobile, Eckener, and Art Smith. The picture *Wings of the Fleet* showed them some of the early flights made by the United States Navy. They discussed the qualities which contribute to the success of a pilot, such as steady nerves and physical endurance, and learned how these are related to proper habits of sleep and to proper food.

Interest in lighter-than-air craft was stimulated by the flight of the Graf Zeppelin from Friedrichshafen to Lakehurst and return. The trip of the Zeppelin was followed by the children. Each day they found out from the newspaper the position of the Zeppelin and then located it on the map. From this trip questions concerning longitude, latitude, and the cause of wind and storms arose.

Byrd's trip to Antarctica led to a discussion of the seasons. The group as a whole discussed different types of airplanes, air mail, air-mail rates, and the length of time it takes to send mail and express packages by airplane. A study of travel between New York and Los Angeles proved very interesting.

To complete the study, the children planned to give a program which would be representative of the work they had done. They decided to write letters inviting people and to make announcements in the various rooms. Posters were made advertising the program. It was decided to charge each of the other children in the school two cents admission.

The program itself was arranged by the children. There were three scenes written by the children and taken from their social-science work: Robin Hood, Daniel Boone, and the people coming to California at the time of the gold rush.

The money obtained from the program was used to restock the aquarium and to buy a female canary and a nesting cage.

The interest in airplanes and in foreign countries did not wane with the close of the semester for during the next semester the children continued to bring newspaper clippings and pictures to school. Some of the children who went to junior high school wrote letters to the class and inclosed clippings.

Organizing the curriculum for the year on an activity basis brought up many pedagogic and social problems, but it was felt by all the members of the class that the experiment had been successful and enjoyable.

A NON-READER LEARNS TO READ

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Case history.—George, seven years and nine months old, was clearly a non-reader at the end of two years in the first and second grades. His case was reported to the writer in July, 1928, by his teacher, a student in a class of the writer's at the University of California.

The school record showed George's intelligence quotient to be 87. He entered the first grade from the kindergarten at the age of five years and eight months. After a semester in Grade I B, he was promoted to Grade I A, but at the end of two weeks he was demoted. After repeating Grade I B, he spent a half-year in Grade I A and a half-year in Grade II B. His promotion to Grade II A was in doubt.

The teacher reported that George was very self-conscious and subject to tantrums and that he had been a serious disciplinary problem. She reported that he did good work in arithmetic.

The mother reported that the boy had liked his kindergarten teacher but had not liked his first-grade teacher. She said that he had a speech impediment which had interfered with his learning to read but that he had overcome it. The writer discovered, however, that he had not entirely overcome the speech impediment. The mother had merely become accustomed to it. In the opinion of the writer, the speech impediment was not one of the main causes of the boy's failure to learn to read.

George was practically unable to score in any of the simplest primary-reading tests. Observations of his reactions in these tests and in his attempts to read the simplest primer material revealed that he had acquired the habit of phenomenal guessing and had developed no ability to perceive likenesses and differences in words.

Results of expert individual instruction.—The parents employed the writer to direct the reading instruction of the boy, and arrange-

ments were made for him to remain out of school for the first half of the school year 1928–29. He was given from thirty to forty minutes of individual instruction daily during a period of five and one-half months. Table I presents the results as shown by tests.

George entered a different school at the beginning of the second semester and was placed in Grade II A. At the end of the first ten weeks his report card read: "Satisfactory—Reading continues to improve." George was contented, justly proud, and happy. He was no longer a disciplinary case.

Reasons for George's failure.—In the opinion of the writer, George had failed in Grade I B mainly because he was mentally immature,

TABLE I

GRADE SCORES ON READING TESTS MADE BY GEORGE IN JULY, NOVEMBER, AND JANUARY*

	July, 1928	November, 1928	January, 1929
Gates Primary Reading Tests:			
Type 1 (Word Recognition)	1.2	2.3	3.2
Type 2 (Word, Phrase, and Sentence Reading)	.....	1.9	3.0
Type 3 (Reading of Directions)	.....	.....	2.4
Gates Graded Word Pronunciation Test	1.0	1.4	.....
Gray Standardized Oral Reading Paragraphs	1.0	.....	1.7

* A score of 1.0 means the lowest point in the first grade or 0 in reading.

having a chronological age of only five years and eight months and a mental age of approximately five years. He probably had also a special disability in remembering visual images of words. With a slight impediment in his speech and a dislike for his teacher in addition to these two serious handicaps, it is not surprising that George failed, developed into a disciplinary case, and was reported by his teacher as being self-conscious.

Methods and materials used.—The two main problems in the early stages of teaching George to read were (1) to find simple easy content which he would desire to be able to read and (2) to develop an ability to perceive the characteristics of words and remember their visual images. For some time great difficulty was experienced in the case of the second problem, and it never ceased to be a prob-

lem. The selection of the *Child-Story Primer* proved to be wise. The illustrations and the content aroused the boy's interest. The dog Terry was an especially strong interest factor. Throughout the instruction careful attention was given to providing strong motives for learning to read. Interesting material and the satisfaction of success were the chief reliance in this connection.

Many special typewritten exercises in great primer type were used to develop word recognition. From the beginning George was taught to write from memory the words used in the reading. Often he spelled the words aloud as he wrote them. His father had taught him the letters a few months before his case was referred to the writer, but the boy had considerable difficulty in learning to distinguish such similar letters as *d* and *b* in print. Manuscript writing was used during the first few months because of its likeness to the printed symbols. However, eventually, when given a choice, George selected the script form of writing, which he had used to some extent in school. After he was well started in reading, only the words he had difficulty in remembering were used for writing and spelling.

Daily drills and tests in word recognition in both meaningful content and in lists of words were given. Each word introduced in the reading was typewritten in great primer type on a card two by three inches in size. The cards were used for daily tests, and George took great interest in seeing the pile of mastered words grow. Various types of matching exercises were used to develop ability to perceive likenesses and differences in words. In all these exercises the boy said the word aloud as he matched it to another copy of the word. Interest in achievement in these exercises proved to be a strong motive.

At the same time great care was taken to see that a joyful experience was had each day in reading simple, meaningful selections containing a minimum of difficulties in word recognition. In addition to the *Child-Story Primer* and the accessory test and seat-work material, the work book entitled *My Progress Book in Reading* (For Beginners) proved very helpful. The *Elson Hand Chart* and the *Elson Primer* together with the accompanying *Silent-Reading Seatwork Pad* proved valuable. *My Reading Book* by Washburne and Youngquist with the accessory material was used co-ordinately

with the other materials. George became very much interested in making perfect scores in the work-book and test exercises involving meaningful reading.

On September 13 and 14, after thirty-two daily sessions of thirty to forty minutes each, George was tested on the recognition of 140 different words which he had met in meaningful reading and in tests of the recognition and pronunciation of words in isolation. He recognized and correctly pronounced 117 of the 140 words without any help. On September 14 he was given the *Child-Story Primer* with instructions to read silently page by page from the beginning until he was told to stop. Care was taken to see that he actually read all the material. In twenty-five minutes he read twenty-seven pages, a total of 116 lines with 92 different words. He asked for help on four different words and for verification on two others. The old habits had been broken, and new habits of the right type had been established.

As a rule, there was some oral reading each day, but silent-reading techniques were relied on mainly.

After George had read a considerable amount of primer material, had thoroughly learned several hundred words through visual perception, and had learned to make a visual analysis of words containing familiar visual units, phonetic aids were introduced gradually and incidentally to supplement visual analysis, and some systematic instruction in phonetics was given. The application of phonetics to the beginning sounds of words, however, was about the only use that George was able to make of his phonetic training even after he was able to read second-grade material readily.

The following lists show the material covered in the five and one-half months of daily individual instruction.

COMPLETE

Elson Hand Chart
Elson Primer
Silent-Reading Seatwork Pad for Use with the Elson Hand Chart and the Elson Primer
Washburne and Youngquist's *My Reading Book* and accessory material
Freeman, Storm, Johnson, and French's *Child-Story Primer* and tests
Freeman, Storm, Johnson, and French's *Child-Story First Reader* and tests
Johnson's *My Progress Book in Reading* (For Beginners)
Buswell's *Practice Exercises for Careful Silent Reading*, Set I

IN PART

The Bolenius Primer and tests
Freeman, Storm, Johnson, and French's *Child-Story Second Reader*
Stone's Silent Reading, Book One
Stone's Silent Reading, Book Two
Horn's *The Learn to Study Readers*, First Lessons in Learning to Study
Buswell's *Practice Exercises for Careful Silent Reading*, Set II

FREE READING AT HOME

Hardy's *Wag and Puff*
Buswell and Wheeler's *Silent Reading Hour*, First Reader

Importance of simple material for poor readers.—Immediately previous to the individual instruction, George's teacher attempted to help him and deserves much credit for her genuine interest in her pupil. For special work at home she had recommended the *Elson First Reader* and accompanying *Silent-Reading Seatwork Pad.* She failed to realize that he needed far simpler material. As a matter of fact, so far as the writer could determine, George actually knew not more than eight or ten words and could not read the material in any primer without considerable help. In nine cases out of ten in classrooms in general, the poorer readers are probably struggling with material involving entirely too many word difficulties. The result is the establishment of inappropriate reading habits and much waste of effort on the part of both teacher and pupils.

Beginning methods and non-readers.—One factor contributing to the present large number of non-readers is the use of methods of teaching beginning reading which go to the extreme in depending on reading based on activities and on story units involving a comparatively large number of word difficulties. Such methods are successful with pupils who experience little difficulty in learning and remembering words, but they are disastrous with pupils of the opposite type, many of whom are normal so far as general intelligence is concerned.

The best method for pupils who experience difficulty in learning and remembering words is a thought-test method, in which the child reads for meaning with a strong interest appeal and in which there is a constant requirement for independent recognition of words in simple comprehension exercises and tests. The problem is to secure a proper balance between reading for thought and attaining mastery of a fundamental vocabulary.

Educational Writings

REVIEWS AND BOOK NOTES

A summary of investigations in English.—Professor Lyman's monograph[1] presenting an interpretative summary of investigations relating to grammar, language, and composition meets a long-felt need. It is an invaluable reference book for students of education engaged in research enterprises which are in any way related to the problem of language-training. It will also be welcomed by all teachers of English who are interested in the scientific approach to the problems of curriculum construction and the improvement of teaching technique. This "summary" is much more than a compendium. It is an interpretation of the trends of thought and effort as revealed by the reported investigations. The author's method in this respect is in keeping with that followed in earlier similar monographs in the same series. At frequent intervals are inserted lists of conclusions which the author deems valid in the light of the studies reviewed. These lists of conclusions are especially helpful to the reader who wishes to gain a meaningful and comprehensive view of the field with the greatest economy of time. They must be considered, of course, as tentative rather than final; they invite rather than preclude further critical analysis.

The author's statement of the purpose of the monograph is as follows:

> It undertakes to assemble, classify, summarize, and interpret the most important studies in this field [language-composition] with the expectation that educators may have in compact form, for work both in revising the curriculum and in modifying methods of teaching, the major facts and principles as they have been revealed by such researches. A supplementary purpose is to indicate the extent to which the scientific movement in education has been applied to grammar, language, and composition, to point out the merits and demerits of the investigations, and to suggest problems that seem to call for additional researches [p. 1].

To this outline of purpose the author has faithfully adhered. By diligent attention to the last point mentioned—the suggestion of problems that seem to call for additional researches—he has rendered an important service to investigators who wish to project new studies toward significant and needful ends. Continually, throughout the monograph, promising suggestions for further study are noted, and questions requiring corroborative data are pointed out.

[1] R. L. Lyman, *Summary of Investigations Relating to Grammar, Language, and Composition.* Supplementary Educational Monographs, Number 36. Chicago: Department of Education, University of Chicago, 1929. Pp. viii+302. $2.00.

In examining the bibliography, the reader is impressed not only by its seemingly complete and inclusive character but especially by the large number of unpublished studies which are listed and described. The organization of the report, based on the bibliography of 264 titles—selected, we are told, from a preliminary bibliography of 415 titles—follows the natural classification of the studies into (1) studies which relate directly to the content and organization of the language-composition curriculum, (2) investigations in correct usage, (3) studies dealing with the problems of measurement in written composition, and (4) investigations relating directly to methods of instruction in the language-composition branches of English. These categories are not presented as mutually exclusive; overlapping is taken care of in the course of the discussion by means of repeated reference. The large amount of material thus classified and reviewed may be so extensive as to confuse the student or teacher not already oriented in the field of English investigations. A less exhaustive survey, however, would undoubtedly have been open to the criticism of incompleteness and would have rendered the monograph less valuable as a source book in education.

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Determining the building needs of city school systems.—The administrator who is faced with the problem of planning and carrying out a systematic school-building program for his city has found much helpful information in the reports of school-building surveys in other communities. Heretofore it has been necessary to look for information with regard to this type of problem in many separate reports and in many cases in only a chapter or two of a more general survey report. A recent publication[1] has brought together in one volume for convenient reference a series of school-building surveys. The surveys were wisely chosen in order to furnish as wide a variety of local situations as possible. The cities included are Lynn, Massachusetts; Watertown, New York; Fort Lee, New Jersey; Paducah, Kentucky; Greensboro, North Carolina; Augusta, Georgia; Jacksonville, Florida; Beaumont, Texas; West Aurora, Illinois; and Rye, New York.

By an examination of the studies included, one is enabled to discover most of the important problems involved in a school-building survey and most of the important techniques used in the solution of these problems. Among the problems on which data are presented for the different school systems are the following: the present school plant; present and probable future population trends; the need for a building program; and the buildings required to house the pupils of elementary-school, junior high school, and senior high school age. In most cases the proposed program is divided into a series of steps, indicating the provisions to be made immediately, those to be made after a few years, and the

[1] N. L. Engelhardt, *School Building Programs in American Cities.* New York: Teachers College, Columbia University, 1928. Pp. xxvi+560.

ultimate program. In this way the program is made to fit the financial capacity of the community.

In order to determine population trends, many different types of data were gathered. Among them are the following: present and past population; distribution of homes; residential permits; number of births in different sections of the city; residential distribution of elementary-school, junior high school, and senior high school population; special factors influencing growth, such as the "generated population" in Fort Lee, New Jersey, due to the projected bridge across the Hudson River from New York City; residential saturation; and predicted growth of the entire city and of different sections.

In many cases the particular defects of the school buildings are pointed out with considerable frankness. The general impression which one gains from reading the descriptions is that the school buildings in most of the cities were in a deplorable condition and that there was no evidence, in most cases, of any systematic planning or location of buildings. The buildings were rated by means of the Strayer-Engelhardt score cards.

Although the compilation of surveys contains much valuable information in a convenient form, it is to be regretted that the author did not see fit to include a summary chapter that would indicate, among other things, the extent to which it is justifiable to depart from the various standards set up. For example, the standard has long been accepted that elementary-school buildings should be so located that no child is required to walk more than a half-mile. To test the observance of this rule, a circle with a radius representing a half-mile is drawn on the map about each elementary-school building as a center. The ideal plan would be one in which the circles cover the territory as completely as possible with no overlapping. This ideal is, of course, never attained, but it is not clear just how much deviation from this ideal is permissible. For example, on page 86 the map of Watertown, New York, which is covered with circles showing conditions as found during the survey, has one circle which is cut by nine other circles. This condition is criticized very severely. On page 25, in a map showing "An Ideal Elementary School Building Program for Lynn, Massachusetts," one circle is cut by seven other circles. Similarly, on page 386, in a map indicating "Ultimate Program for Elementary Schools in Independent School Tax District No. 1, Jacksonville, Florida," one circle is cut by seven other circles. The extent to which one may neglect the rule with regard to the overlapping of circles and at the same time have an ideal program is not clear. A summary chapter might have answered this and other questions. As it is, the principles are a little difficult to deduce from the samples given. However, the book has many advantages in calling attention to the building situations in the type communities and to the methods used in improving them.

R. L. C. BUTSCH

An objective study of good and poor teachers of the social studies.—A canvass of the literature on supervision that has appeared during the past two years is

certain to leave the reader with the impression that a tremendous amount of effort is now being expended to make the methods of supervision more valid, reliable, and objective. The producers of some of this literature proceed on the assumption that in the classroom one may find observable activities and teaching performances that can be objectively described. This assumption has been tested in a recent study.[1] Forty-seven teachers of the social studies in junior and senior high schools whose superior ability as teachers of these subjects had been recognized and an equal number of teachers with less than average ability were selected for special observation and study. Each of the ninety-four teachers was visited and studied with respect to teaching posture, characteristic actions and expressions, vocabulary, the assignment, questions, comment on pupil's response, attention to pupil's recitation, use of illustrative materials, economy of time, discipline, supervised study, and approximately twenty-five other activities or teaching exercises or devices.

In presenting the results of his study, Professor Barr condenses the foregoing items into eighteen main headings: teaching posture, characteristic actions of the teacher, characteristic comments of the teacher, economy of time, discipline, motivation, provision for individual differences, organization of subject matter, use of illustrative materials, the assignment, the teacher's questions, the pupil's response, the teacher's attention to the pupil's response, expository comments of the teacher, appraisal of the pupil's response, elements of strength in the recitation, elements of weakness in the recitation, and personal qualities of the teacher. Interesting material is presented under each of these eighteen headings. For example, in the case of the assignment, the study shows that twenty-one of the forty-seven poor teachers gave page-to-page assignments while none of the good teachers used this device. Ten of the forty-seven good teachers made use of mimeographed outlines in making assignments. No poor teacher used a mimeographed outline. On the whole, the good teachers made a better showing on each of the eighteen phases of work than did the poor teachers. Besides the qualitative differences in good and poor teachers of the social studies which the study reveals, certain quantitative differences are evident. These relate to such matters as the number of minutes devoted to the assignment, class discussion, supervised study, map work, and other activities. There was apparently not a great deal of difference between the good and the poor teachers in the phases of their work which could be measured quantitatively.

On the whole, Professor Barr has made a valuable contribution to the literature of teaching the social studies. Granted that the forty-seven good teachers were rated correctly, it is possible now to describe a good teacher in terms of actual performance. Professor Barr describes a good teacher on page 115 and a poor teacher on pages 115–16. The descriptions will prove interesting and valuable to supervisers and teachers of the social studies.

R. M. TRYON

[1] A. S. Barr, *Characteristic Differences in the Teaching Performance of Good and Poor Teachers of the Social Studies*. Bloomington, Illinois: Public School Publishing Co., 1929. Pp. viii+128. $1.25.

A quiz manual for teachers.—Quiz manuals or question books have long been used in such professions as engineering, pharmacy, and medicine. One is now available covering the general field of education.[1]

The book is defended on the ground that during the past quarter of a century an educational revolution has taken place, resulting in an expansion of knowledge relating to education and a correspondingly increased degree of specialization.

> The rapid accumulation of this new-found knowledge has put many of those concerned with education in a perplexing situation. There is no single source which contains information on the most recent developments in the field. Education has become so highly specialized that it is necessary to read very widely in order to become familiar with the entire field. There has been a real need for a compilation of the outstanding facts and theories in each of the various subdivisions of education [p. iii].

The book has three major divisions. The first, which includes about one-third of the total number of pages, contains classified lists of questions relating to special and general methods, classroom management, psychology, tests and measurements, the curriculum, history of education, comparative education, statistics, various phases of educational administration, the teaching personnel, secondary and higher education, physical education, vocational guidance, and miscellaneous general information. The second division, which contains 130 pages, gives the answers to the questions in the first division. These answers vary from a single word or a line to a half-page of discussion devoted to some controversial issue. The third division of the book contains a selected bibliography of 273 titles. There is also a rather detailed index. Following some of the answers are page references to items in the bibliography.

The book contains approximately a thousand questions. Random samples of the questions are as follows:

> How many basic combinations are there in addition? [P. 3]
> What is intelligence? [P. 31]
> What is the CAVD Test? [P. 36]
> What subjects do most educators agree should be required throughout high school? [P. 40]
> What is a histogram? [P. 51]

The authors suggest that the book may be used as a handbook for students of education, as a means of self-improvement by teachers, as a reading-circle assignment, as an aid in formulating examination questions, and as a basis for programs of parent-teacher associations. Probably the commonest use which will be made of the book, as judged from the use of such books in other fields, will be in "cramming" for examinations.

The value of the book to the teaching profession will depend altogether on how it is used. Where used chiefly as a "cram" book, it will doubtless result in an encyclopedic body of superficial information. It will be unfortunate if

[1] Willard S. Elsbree, H. R. Halsey, and Elizabeth S. Elsbree, *The Teacher's Handbook.* New York: Teachers College, Columbia University, 1929. Pp. viii+290.

students find such a body of information acceptable to their instructors. Students may use the book for a rapid examination of their own knowledge concerning the topics covered. This use may be commendable provided the students support the brief answers given by reference to the bibliography. The bibliographical references, however, are too limited to afford much satisfaction to a serious-minded student. The reviewer doubts whether the book will result in more than a superficial knowledge that will make the reader more glib in discussing topics about which he knows very little.

G. T. BUSWELL

Accomplishment of problem children in school as studied by the statistical and case methods.—One of the most recent methods of educational investigation, namely, that of case analysis, has come to be used extensively within the past few years. Probably the best example in educational literature of the use of this method, Reavis' *Pupil Adjustment in Junior and Senior High Schools*, appeared as recently as 1926. In utilizing this valuable technique of investigation, students of education have followed the lead of workers in the fields of law, medicine, social service, and military science. The case method is used not only in making individual case analyses in the study of problems of reading, arithmetic, problem children, superior children, genius, mental abnormality and deficiency, adolescence, mental hygiene, personality, special talents and defects, supervision, and classroom method but also in organizing textbooks in various divisions of the field of education.

The Commonwealth Fund has been especially active in the investigation of problem children. It has published three studies based on the interpretation of individual case records. A recent report[1] issued by this organization is based on data taken from the case records of the demonstration child-guidance clinics at Los Angeles and Philadelphia. In the Los Angeles group there were 167 children and in the Philadelphia group 163 children. Individuals with intelligence quotients below 80 were excluded from the investigation. Behavior difficulties were found in 87.4 per cent of the Los Angeles cases and in 84.0 per cent of the Philadelphia cases. The clinical study of each child included the recording of the child's social history and the giving of medical, psychological, and psychiatric examinations.

The authors conclude that problem children show no general tendency toward low educational achievement. However, they do not go so far as to say that educational adjustment in the narrow sense of scholastic accomplishment is never affected by the child's difficulties in non-intellectual fields. The authors quite appropriately point out that, while the children studied did not seem educationally maladjusted according to the restricted meaning of educational achievement, they were educational misfits when education is conceived of as

[1] Richard H. Paynter and Phyllis Blanchard, *A Study of Educational Achievement of Problem Children*. New York: Commonwealth Fund (578 Madison Avenue), 1929. Pp. x+72. $1.00.

preparation for adult social adjustments. The fact that 31 per cent of the cases included in the investigation were reported to the clinic, with requests for study, by teachers, principals, nurses, or others employed within the school system and that an additional 26 per cent of the Los Angeles cases and an additional 39 per cent of the Philadelphia cases were recognized as problems by teachers is cited as evidence that teachers are interested in problems of maladjustment other than poor scholastic standing.

The data of the study are presented in twenty-two tables. An index should have been provided. Related investigations are summarized, and comparisons are made with the findings of the authors. Limitations of the study, such as the lack of a control group of unselected children, dangers in the statistical treatment of a small number of cases, imperfections in psychological and educational tests, and shortcomings of the several quotients and ratios, are discussed. Certainly the Commonwealth Fund is to be commended for its valuable work in the promotion and publication of studies of problem children. Education has much to learn from medicine concerning the use of clinical and case methods in the solution of problems of maladjustment.

CARTER V. GOOD

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Health supervision and education in the schools.—Many books and articles on various phases of health supervision in the public schools have been published, particularly during the past decade, but there is little such material that extends over the needs in the field so well as does Mr. Keene's book[1] on this subject. The purpose of the book is well set forth in the Preface:

> It becomes necessary, therefore, to collect in one book a résumé of information concerning the present-day school health program so that the young men and women attending teacher-training institutions, teachers, principals, supervisors, and superintendents may have readily available authentic material [p. ix].

The book contains an introduction by Ellwood P. Cubberley, a preface, a table of contents, an introduction, twenty-one chapters, and an index. At the end of each chapter are challenging problems and a bibliography.

The author believes that the health program for school children should be carried out by the public school rather than by the health department but that the school should at all times co-operate with the health department by reporting contagious diseases and receiving reports of contagious diseases from the health department.

A very complete program for school health work is outlined. This program includes the proper choice of the school site; the sanitary management of the plant; the introduction of various branches of physical education, with special emphasis on those phases that reach large groups of pupils; the supervision of health with respect to prevention, cure, and protection; the arrangement of the

[1] Charles H. Keene, *The Physical Welfare of the School Child.* Boston: Houghton Mifflin Co., 1929. Pp. xii+506. $2.40.

school program on a hygienic basis with special reference to rest periods, lunches, and apportionment of time; the proper care of the health of teachers; the training of teachers in hygiene; and the training of pupils in health.

The personnel of the staff of health administration is discussed in some detail, and specific duties are allocated to its members.

Several items of detailed, useful information are given, of which the following are examples: (1) On pages 30–34 and 37–41 are specifications for playgrounds and playground equipment; standards for the size of school playgrounds in relation to enrolment; and recommended playground equipment for Grades I–VI, with estimated costs. (2) On pages 49–50 are specifications by grades for the height and arrangement of clothes hangers. (3) Page 55 shows the distance the blackboard should be from the floor in each grade. (4) On pages 122–26 regulations governing the administrative routine of the school physician are suggested.

The book is well arranged for use as a textbook in teacher-training institutions and is a valuable reference book for school administrators.

MARTHA ELIZABETH STONE

Laboratory manual for elementary science.—Teachers of elementary science will be interested in a manual of experiments[1] by Bertha F. Gordon. Approximately one-third of the book is devoted to directions for conducting the experiments; the remainder is descriptive. Twenty-two topics are treated, including heat, distillation, fermentation, electricity, chemistry, the air, cement and concrete, the weather, and astronomy—a wide range of topics for the limited space.

Both the treatment of topics and the language used are simple. The experiments are easily possible for elementary-school pupils. The basis on which the material has been selected and organized is not at all obvious; perhaps the author has found in her teaching experience that the subject matter appeals to elementary-school pupils.

One error occurs repeatedly, namely, the assumption that a generalization is proved by a single experiment. Thus, on page 9, "the color of a substance makes a difference in its radiation of heat. You can prove this by an easy experiment." Again, on page 30, "by this experiment you have proved one of the important laws of magnetism."

There are many inexact and misleading statements in the book—four on page 108, for instance. The phrase "by volume" is omitted in the first sentence under "Hydrogen." Sound waves will carry through hydrogen although the author states the contrary. The "it" in "We call it carbonic acid gas" apparently refers to oxygen. "Just as *we* need oxygen to live on, so do all plants need carbonic acid" is an unjustifiable analogy; the uses of the two gases are quite unlike.

E. R. DOWNING

[1] Bertha F. Gordon, *Prove It Yourself:* A Book of Easy Experiments in Elementary Science. Dansville, New York: F. A. Owen Publishing Co., 1928. Pp. 256. $1.50.

An introductory textbook in elementary education.—The nature and the number of topics that are treated in a book designed as an introductory textbook and entitled "Principles of Elementary Education" must of necessity rest on the arbitrary decision of the author alone. The range of topics discussed in the most recent publication by this title[1] is especially wide, as will be evident from the following description of the contents.

The short first chapter is intended to outline for the reader the plan and the contents of the book. The remaining sixteen chapters are grouped into five parts, each of which is essentially a unit. Part I traces the development of the American school system and seeks to discover the true relation between elementary education and secondary education. In fixing the scope of the former, the author severely criticizes those who in this connection employ such criteria as the age of the pupils and the number of grades, and he supports with apparent enthusiasm Morrison's contention that the only valid definition is one based on function. The reader is hardly prepared, therefore, to find the author reverting to a definition of the elementary school as a six-year institution and using the term with this meaning throughout the rest of the book, as, for example, on page 244, where he decries the general failure to establish a "boundary line between the six-year elementary and the junior high school." His attempt to justify his anomalous position on "practical" as opposed to "technical" grounds is neither convincing nor helpful.

Part II, "The School and Society," considers the relation of the school to local, county, state, and national authority; the multiplying demands on the school; and certain problems involved in compulsory education. In Part III the curriculum, methods of instruction, and individual differences are discussed in one chapter each as the "three major factors affecting instruction." The "organization of instruction" is described in Part IV in terms of content and methods for the primary, intermediate, and upper grades and in terms of the organization of the staff for effective work. Part V, "The School at Work," deals with certain matters of administration, the enforcement of compulsory-attendance laws, special education for handicapped children, training for teaching, and the status of teaching.

In attempting to include such a variety of material within 388 pages, the author imposes on himself difficult tasks of organization and presentation. At times evidences of the difficulties come between the reader and the content. It is as if the author himself were aware of his ambitious undertaking and, fearful of losing his reader, were seeking by force of repeated outlining and summarizing to maintain contact. The effects of limited space are frequently noticeable in the necessarily abbreviated treatments of important topics. Thus, the teaching in primary reading is disposed of in six pages; and the psychology of childhood, which the author himself states to be basic to teaching methods, is treated in ten pages under the three headings "Rousseau," "The Project," and "So-

[1] John Louis Horn, *Principles of Elementary Education.* New York: Century Co., 1929. Pp. xii+394. $2.00.

cialization." While one cannot expect extended discussions in an introductory textbook, one may well question the value of such brief résumés. Again, the bibliographical references are almost without exception to theoretical works similar in nature to the book itself. It would seem preferable to direct the reader, at least occasionally, to original material. Perhaps the greatest weakness of the book, however, is its apparent indifference to the scientific movement in education. Certainly one of the chief purposes of such a textbook should be to acquaint the beginner with the presence and the significance of the experimental studies which are remaking the school and its instrumentalities.

To be contrasted with these less satisfactory features of the book are a number of features which are certainly deserving of commendation. The author's style has the same qualities of clarity, precision, and vigor that are characteristic of his earlier works. Especially good, too, is his straightforward criticism of current efforts to remodel the elementary curriculum both for the failure to produce tangible results and for the absence of fundamental conceptions and valid techniques. His warning against fads in methods of teaching and forms of school organization is also timely and appropriate. Last of all, his emphasis on functions and purposes in elementary education rather than on less essential aspects is wholesome and effective. It is in these last respects that the textbook makes its largest contribution.

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